This document gives pertinent information concerning the reissuance of the Virginia Pollutant Discharge Elimination System (VPDES) Permit listed below. This permit is being processed as a Minor, Industrial permit. The discharge results from the operation of a 240 megawatt (MW) coal fired electric generating facility. This permit action consists of updating the proposed effluent limits to reflect the current Virginia Water Quality Standards (effective January 6, 2011) and updating permit language as appropriate. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards (WQS) of 9VAC25-260-00 et seq.

1.	Facility Name and Mailing Address:	Birchwood Power Facility 10900 Birchwood Drive King George, VA 22485	SIC Code :	4911 – Electric Services
	Facility Location:	10900 Birchwood Drive King George, VA 22485	County:	King George
	Facility Contact Name:	Ms. Carla Jones	Telephone Number:	(540) 775-6304
	Facility E-mail Address:	Carla.Jones@naes.com		
2.	Permit No.:	VA0087645	Expiration Date of previous permit:	December 7, 2014
	Other VPDES Permits associated with this facility:		None	
	Other Permits associated with this facility:		Air – Registration Number 040809 (Title V) Virginia Water Protection Program (VWPP) – 91-1692 Groundwater Existing User – GW00187EU*	
	*See Section 28 of the Fact Sheet for additional information on this permit.			
	E2/E3/E4 Status:	Application Pending (E3)		
3.	Owner Name:	Birchwood Power Partners, LP		
	Owner Contact/Title:	Ms. Julie Caiafa / Vice President GESF Birchwood-GP LLC on behalf of Power Holding LLC as Managing Member		
	Owner E-mail Address:	julie.caiafa@ge.com	Telephone Number:	(540) 775-6320
4.	Application Complete Date:	July 8, 2014		
	Permit Drafted By:	Susan Mackert	Date Drafted:	March 3, 2016
	Draft Permit Reviewed By:	Alison Thompson	Date Reviewed:	March 15, 2016
	WPM Review By:	Bryant Thomas	Date Reviewed:	April 12, 2016
	Public Comment Period :	Start Date: August 11, 2016	End Date:	September 12, 2016

5. Receiving Waters Information:

Receiving Stream Name :	Rappahannock River	Stream Code:	3-RPP
Drainage Area at Outfall:	1720 square miles	River Mile:	97
Stream Basin:	Rappahannock	Subbasin:	None
Section:	1	Stream Class:	II
Special Standards:	a	Waterbody ID:	VAN-E21E
7Q10 Low Flow:	Tidal	7Q10 High Flow:	Tidal
1Q10 Low Flow:	Tidal	1Q10 High Flow:	Tidal
30Q10 Low Flow:	Tidal	30Q10 High Flow:	Tidal
Harmonic Mean Flow:	Tidal	30Q5 Flow:	Tidal

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

X	State Water Control Law	X	EPA Guidelines (40 CFR Part 423)
X	Clean Water Act	X	Water Quality Standards
X	VPDES Permit Regulation		
X	EPA National Pollutant Discharge Elimination System (NPDES) Regulation		

7. Licensed Operator Requirements: NA (Industrial Discharge)

8. Reliability Class: NA (Industrial Discharge)

9. Permit Characterization:

X	Private	X	Effluent Limited		Possible Interstate Effect
	Federal	X	Water Quality Limited		Compliance Schedule Required
	State	X	Whole Effluent Toxicity Program Required		Interim Limits in Permit
	WTP		Pretreatment Program Required		Interim Limits in Other Document
	TMDL	X	e-DMR Participant		

10. Wastewater Sources and Treatment Description:

The Birchwood Power Facility is an existing coal fired power plant which became operational in 1996. The facility consists of one coal fired boiler and one steam turbine generator which generates 240 MW for exclusive use by Dominion Virginia Power. The facility has been designed to minimize use of water and is further operated so as to minimize or eliminate discharges of treated wastewater. As such, the facility has not discharged since January 2006. A detailed description of the facility's water and ash handling processes was provided by the facility and is found as Attachment 1.

See Attachment 2 for the NPDES Permit Rating Worksheet.

See Attachment 3 for a facility flow diagram.

TABLE 1 – Outfall Description

Outfall Number	Discharge Sources	Treatment	Average Flow	Outfall Latitude and Longitude
001	Industrial Wastewater/Stormwater	See Item 10 above.	No Discharge	38° 14' 34.2" N 77° 17' 36.5" W

*A component of the reissuance process involves a review of outfall coordinates and receiving streams by DEQ planning staff. Based on this review, the coordinates in Table 1 above may differ from those found within the permit application.

11. Solids Treatment and Disposal Methods:

The Birchwood Power Facility is an existing coal fired electric generating station. All domestic wastewater is treated and disposed of through a septic tank/drain field system.

12. Monitoring Stations and Discharges in Vicinity of Discharge:

The facilities and monitoring stations listed below either discharge to or are located within the waterbody VAN-E21E.

TABLE 2 – Other Items	
3-RPP080.19	DEQ fish tissue / sediment monitoring station at Route 301.
3-RPP098.81	DEQ Chesapeake Bay/ambient monitoring station located approximately 2.8 miles upstream of the discharge location on the Rappahannock River at Buoy 112.
VA0060429	Four Winds Campground Sewage Treatment Plant (Rappahannock River)
VA0089338	Hopyard Farm Wastewater Treatment Facility (Rappahannock River)
VA0090654	Greenhost Incorporated (Birchwood Run, UT)
VAG406465	David Hurdle Residence (Keys Run)
VAG840195	Aggregate Industries MAR – Hayfield Sand and Gravel (Rappahannock River)
VAG840227	Rappahannock Farms Sand and Gravel Facility (Rappahannock River)

13. Material Storage:

A current list of materials stored on site was provided by the facility subsequent to the submittal of the application package. This information is found as Attachment 4. All materials are stored within some form of secondary containment.

14. Site Inspection:

A site inspection was performed by Susan Mackert and Alison Thompson on February 4, 2016. The site visit confirms that the information provided in the facility's permit reapplication package received June 5, 2014, is accurate and representative of actual site conditions. The site visit memo can be found as Attachment 5.

15. Receiving Stream Water Quality and Water Quality Standards:

a. Ambient Water Quality Data

This facility is located on the Rappahannock River. DEQ Chesapeake Bay/ambient station 3-RPP098.81 is located at Buoy 112, approximately 2.8 miles upstream from Outfall 001. DEQ fish tissue/sediment station 3-RPP080.19 is located at Route 301, approximately 22 miles downstream from Outfall 001. The following is the water quality summary for this segment of the Rappahannock River, as taken from the 2012 Integrated Report:

Class II, Section 1, special standards – a.

DEQ monitoring stations located in this segment of Rappahannock River:

- DEQ Chesapeake Bay/ambient station 3-RPP098.81, at Buoy 112.

The fish consumption use was assessed using DEQ fish tissue/sediment station 3-RPP080.19 (located in a downstream segment)and is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, Polychlorinated Biphenyl (PCB) fish consumption advisory and sufficient excursions above the fish tissue value (TV) for PCBs in fish tissue. Additionally, excursions above the risk-based tissue value (TV) of 300 parts per billion (ppb) for mercury (Hg) in fish tissue was recorded in one species of fish (1 total samples) collected in 2006 at monitoring station 3-RPP080.19 (channel catfish), noted by an observed effect.

E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. A bacteria Total Maximum Daily Load (TMDL) for this portion of the Rappahannock River was approved by EPA on 05/05/2008.

The aquatic life is considered fully supporting for this tidal segment. A TMDL has been completed for the Chesapeake Bay watershed. This downstream TMDL completed by EPA addresses the water quality impairments in the Chesapeake Bay, and takes into account the entire Bay watershed including upstream tidal tributaries such as the Rappahannock River.

The wildlife use is considered fully supporting. The shellfishing use was not assessed.

b. 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs)

Waterbody Name	Impaired Use	Cause	TMDL Completed	Wasteload Allocation (WLA)	Basis for WLA	TMDL Schedule
Rappahannock River	Recreation	*E. coli*	Rappahannock River Bacteria 5/5/2008	None (not expected to discharge pollutant)	---	---
	Fish Consumption	PCBs	---	---	---	TBD*
*To Be Determined.						

Significant portions of the Chesapeake Bay and its tributaries are listed as impaired on Virginia's 303(d) list of impaired waters for not meeting the aquatic life use support goal, and the 2012 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report indicates that much of the mainstem Bay does not fully support this use support goal under Virginia's Water Quality Assessment guidelines. Nutrient enrichment is cited as one of the primary causes of impairment. EPA issued the Bay TMDL on December 29, 2010. It was based, in part, on the Watershed Implementation Plans developed by the Bay watershed states and the District of Columbia.

The Chesapeake Bay TMDL addresses all segments of the Bay and its tidal tributaries that are on the impaired waters list. As with all TMDLs, a maximum aggregate watershed pollutant loading necessary to achieve the Chesapeake Bay's water quality standards has been identified. This aggregate watershed loading is divided among the Bay states and their major tributary basins, as well as by major source categories [wastewater, urban stormwater, onsite/septic agriculture, air deposition]. Fact Sheet Section 17.c.1.i provides additional information on specific nutrient monitoring for this facility to implement the provisions of the Chesapeake Bay TMDL.

The full planning statement is found in Attachment 6.

c. Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, the Rappahannock River, is located within Section 1 of the Rappahannock River Basin, and classified as a Class II water.

Class II tidal waters in the Chesapeake Bay and it tidal tributaries must meet dissolved oxygen concentrations as specified in 9VAC25-260-185 and maintain a pH of 6.0-9.0 standard units as specified in 9VAC25-260-50. In the Northern Virginia area, Class II waters must meet the Migratory Fish Spawning and Nursery Designated Use from February 1 through May 31. For the remainder of the year, these tidal waters must meet the Open Water use. The applicable dissolved oxygen concentrations are presented Attachment 7.

Attachment 8a and Attachment 8b detail other water quality criteria applicable to the receiving stream. For purposes of this reissuance, staff has utilized a long term average flow of 0.049 MGD to develop the water quality criteria given a discharge has not occurred since January 2006.

Ammonia:
The freshwater, aquatic life Water Quality Criteria for Ammonia are dependent on the instream and/or effluent temperature and pH. The 90th percentile temperature and pH values are used because they best represent the critical design conditions of the receiving stream. Because neither instream nor effluent data is available for temperature or pH, staff utilized a default temperature value of 25°C and a default pH value of 8.0 S.U. Due to the fact the discharge is industrial in nature, ammonia, as N, is generally not a parameter of concern and there is no reasonable potential to exceed the ammonia criteria. As such, limit derivation is not warranted.

The ammonia water quality standards calculations are shown in Attachment 8a and Attachment 8b.

Metals Criteria:
The Water Quality Criteria for some metals are dependent on the receiving stream's hardness (expressed as mg/L calcium carbonate). Staff previously used available data from ambient monitoring station, 3-RPP091.55, located approximately 6.3 miles downstream from the outfall location. As noted in the previous reissuance in 2009, DEQ staff reevaluated hardness data for four major dischargers in the proximity of the facility. DEQ staff determined that the ambient hardness data did not reflect what the instream hardness would be under design conditions, i.e., drought flows and the four major dischargers at design flow. It was also felt that there was uncertainty in the mixing zones; therefore, determining an accurate mass balance between the four major dischargers and the background river hardness would not be feasible. As such, a default hardness value of 50 mg/L was used to calculate their metals criteria. Because of the proximity of Birchwood Power to these four major dischargers, the same assumptions can be applied to determining river hardness. A default value of 50 mg/L will be used to calculate metals criteria.

d. Receiving Stream Special Standards
The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, the Rappahannock River, is located within Section 1 of the Rappahannock River Basin. This section has been designated with a special standard of "a".

The receiving stream has been designated with a special standard of "a." According to 9VAC25-260-310.a, Special Standard a applies to all open ocean or estuarine waters capable of propagating shellfish or in specific areas where public or leased private shellfish beds are present, including those waters on which condemnation or restriction classifications are established by the State Department of Health. The fecal coliform bacteria standard is as follows: the geometric mean fecal coliform value for a sampling station shall not exceed an MPN (most probable number) of 14 per 100 milliliters of sample and the 90th percentile shall not exceed 43 for a 5-tube, 3-dilution or 49 for a 3-tube, 3-dilution test. The shellfish are not to be so contaminated by radionuclides, pesticides, herbicides, or fecal material that the consumption of shellfish might be hazardous. This same standard is also contained in 9VAC25-260-160. Fecal Coliform Bacteria; Shellfish Waters. This standard is used for the interpretation of instream monitoring data and not for setting fecal coliform effluent limitations.

Special standard "a" is not applied to the discharge from Birchwood Power Facility as the discharge is industrial in nature and does not contain domestic wastewater sources.

e. Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on August 6, 2015, for records to determine if there are threatened or endangered species in the vicinity of the discharge. Threatened or endangered species were identified within a 2 mile radius of the discharge. The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and protect the threatened and endangered species found near the discharge.

The stream that the facility discharges to is within a reach identified as having an Anadromous Fish Use. It is staff's best professional judgment that the proposed limits are protective of this use.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 1 based on a re-evaluation of the VIMS model in August 2006. Since the onset of using the model, the established model segments have been used, by default, to define river sections into individual waterbodies for the antidegradation analysis. Historically, four segments were identified as Tier II through this process: Segment 16, Segment 20, Segment 23, and Segment 26. Each was identified through separate permit actions that did not initially involve the VIMS model. When a segment was analyzed as Tier II, two parameters generally were assessed, ammonia and dissolved oxygen (DO). Ammonia levels were kept below the baselines and DO was kept to no lower than 0.2 mg/L of the concentration predicted in the August 14, 1995 background model run. For the purposes of the August 2006 model run, the entire Rappahannock River was considered Tier I.

Because the facility is located within Segment 16, the Tier I rating shall be carried forward with this reissuance. Permit limits proposed have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are the calculated on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a. Effluent Screening:
Effluent data is not available as the facility operates in manner that minimizes water usage and wastewater discharges. A discharge has not occurred since January 2006.

b. Tidal Water Quality Wasteload Allocations (Tidal WQWLA):

The Rappahannock River at the point of discharge is a tidal estuary. For tidal estuaries, the acute wasteload allocations are established by multiplying the acute water quality criteria by a factor of 2 unless there is site specific dilution data available. The two times factor is derived from acute criteria being defined as one half of the final acute value (FAV) for a specific toxic pollutant. The FAV is determined from exposure of the specific toxicant to a variety of aquatic species, and is based on the level of a chemical or mixture of chemicals that does not allow the mortality, or other specified response, of aquatic organisms. These criteria represent maximum pollutant concentration values, which when exceeded, would cause acute effects on aquatic life in a short time period. For chronic wasteload allocations a dilution of 50 is used unless there is site specific dilution data available. The above Tidal WQWLA determinations are consistent with the instructions found within DEQ Guidance Memo 00-2011.

The permittee conducted a detailed analysis of the mixing zone conditions and evaluated the accuracy of the mixing zone dimensions that were developed. The study was submitted to DEQ and approved on January 21, 1997. The approved Mixing Zone Study is part of NRO's modeling files and defined the dimensions of the mixing zones as follows: the allocated impact (acute) zone is 68.5 feet in length and 47.9 feet in width. The acute dilution factor is determined to be 5.43:1. Due to the intermittent nature of the discharge, the facility did not develop a chronic dilution factor. Therefore, a default value of 50 will be used. Tidal WQWLA will be determined per instructions found in DEQ Guidance Memo 00-2011.

$$WLA = 5.43(C_o) - C_s$$

where:
WLA = wasteload allocation
C_o = in-stream Water Quality Standard
C_s = mean background concentration of parameter in stream

Attachment 8a summarizes the acute wasteload allocation determinations and Attachment 8b summarizes the chronic wasteload allocation determinations.

c. Effluent Limitations and Monitoring

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from Publicly Owned Treatment Works (POTW) and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

The discharge from Outfall 001 is also limited by Federal Effluent Guidelines established in 40 CFR Part 423. Effluent Limitation Guidelines are technology-based regulations that have been developed by the U.S. Environmental Protection Agency (EPA) for a specific category of discharger and are based on the performance of control and treatment technologies.

Effective November 3, 2015, EPA adopted a final rule updating the Effluent Limitation Guidelines and Standards for the Steam Electric Power Generating Point Source Category. The updated rule broke Section 423.15 New Source Performance Standards (NSPS) in to two subparts, "a" and "b", with subpart "a" pertaining to new sources as of November 19, 1982, and subpart "b" pertaining to new sources as of November 17, 2015. It is staff's professional judgement that subpart "a" of the updated rule is applicable with the 2016 reissuance given the facility became operational in 1996.

Pursuant to this updated rule, Section 423.15(a) states that any new source as of November 19, 1982, must achieve the new source performance standards within the section in addition to the limitations in §423.13 (Best Available Technology Economically Achievable), established November 3, 2015. In the case of conflict, the more stringent requirements apply. With this reissuance staff compared both of the aforementioned sections of the new rule and applied the more stringent requirement. See Section 17.c.1 below for additional discussion.

Additionally, when applicable, both water quality based limits and Federal Effluent Guideline requirements were compared. The most stringent limitation was used as the basis for the final limit.

The following Federal Effluent Guideline abbreviations are used within the discussions in Section 17.c.1 and Section 19 of the Fact Sheet:

New Source Performance Standards – NSPS
Best Available Technology Economically Achievable – BAT

1) Outfall 001

The effluent limit discussion below is presented based on the individual waste streams identified within Federal Effluent Guidelines 40 CFR 423.15 and 40 CFR 423.13.

a. Coal Pile Runoff

Total Suspended Solids (TSS):

In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15 – NSPS and 40 CFR 423.13 – BAT. Coal pile runoff requirements for TSS are only found within 40 CFR 423.15(a)(11) – NSPS. This section states that the quantity or quality of pollutants or pollutant parameters discharged in coal pile runoff shall not exceed the specified standard of 50 mg/L at any time. Previous reissuances of this permit have not specifically addressed coal pile runoff through the implementation of a 50 mg/L effluent limitation. With this reissuance staff recommends that a daily maximum TSS limit of 50 mg/L be implemented to address the requirements associated with coal pile runoff. Because the facility has not discharged since 2006, staff proposes a monitoring contingent upon a discharge, not to exceed once in a given calendar month.

In accordance with 40 CFR 423.15(a)(12) – NSPS, any untreated overflow from facilities designed, constructed, and operated to treat the coal pile runoff which results from a 10 year, 24 hour rainfall event shall not be subject to the standards noted above.

b. Once Through Cooling Water

Total Residual Chlorine (TRC):
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15(a)(8)(i) – NSPS and 40 CFR 423.13(b)(1) – BAT. Both sections state that for any plant with a total rated electric generating capacity of 25 or more megawatts, the quantity of pollutants discharged in once through cooling water from each discharge point shall not exceed the quantity determined by multiplying the flow of once through cooling water times the maximum concentration of 0.2 mg/L. Given the requirements are the same for both sections of the rule, it is staff's professional judgement that the basis for the limitation be based on the NSPS to provide consistency with rationale utilized in past reissuances.

At the permitting authority's discretion (Federal Effluent Guidelines 40 CFR 423.15(a)(13)), the quantity of pollutants allowed to be discharged may be expressed as a concentration limitation instead of the mass based limitation specified in paragraph 423.15(a)(8)(i). It is staff's professional judgement that applying the maximum concentration of 0.2 mg/L to the discharge is appropriate and allows for comparison to the Virginia WQS for TRC which are established in concentration units.

In accordance with current DEQ guidance, staff used a default data point of 0.2 mg/L and the calculated WLAs to derive limits. The resulting water quality based derivation indicated a water quality based maximum limit of 0.016 mg/L is needed (Attachment 9).

The water quality based limit is more stringent than the Federal Effluent Guidelines and as such, the water quality based limit shall be applied. This limit is more stringent than the water quality based maximum limit developed during the previous reissuance. This is due to acute and chronic wasteload allocation determinations taking in to consideration the mixing zone study as noted in Section 17.b of the Fact Sheet which had previously not been applied. As such, a maximum TRC limit of 0.016 mg/L shall be implemented with this reissuance. Because the facility has not discharged since 2006, staff proposes a change to the monitoring frequency from once per month (1/M) to contingent upon discharge, not to exceed once in a given calendar month.

Free Available Chlorine:
The previous reissuance of this permit did not included free available chlorine limitations. As such it is staff's professional judgement that the need for free available chlorine limits be evaluated. In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15 – NSPS and 40 CFR 423.13 – BAT. Once through cooling water requirements for free available chlorine are only found within 40 CFR 423.15(a)(10)(i) – NSPS. This section states that the quantity of pollutants discharged in once through cooling water shall not exceed the quantity determined by multiplying the flow of once through cooling water times the maximum concentration of 0.5 mg/L and the average concentration of 0.2 mg/L.

The sum of free available chlorine and combined available chlorine form total residual chlorine. If established total residual chlorine limits are met, it is assumed free available chlorine will be equivalent to or less than the total residual chlorine. As discussed above, total residual chlorine limitation (maximum of 0.016 mg/L) was developed based on the once through cooling water component of the discharge from Outfall 001. Free available chlorine associated with the once through cooling water component would be expected to be equivalent to or less than the established total residual chlorine limitation and therefore, comply with the Federal Effluent Guideline 40 CFR 423.15(a)(10)(i)) limitations (daily maximum of 0.5 mg/L and a monthly average of 0.2 mg/L).

As such, it is staff's professional judgement that free available chlorine limitations are not warranted given the total residual chlorine limitation is more stringent.

c. Cooling Tower Blowdown

Free Available Chlorine:
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15(a)(10)(i) – NSPS and 40 CFR 423.13(d)(1) – BAT. Both sections state the quantity of pollutants discharged in cooling tower blowdown shall not exceed the quantity determined by multiplying the flow of once through cooling water times the maximum concentration of 0.5 mg/L and the monthly average concentration of 0.2 mg/L. Given the requirements are the same for both sections of the rule, it is staff's professional judgement that the basis for the limitation be based on the NSPS to provide consistency with rationale utilized in past reissuances.

Based on the discussion noted in Section 17.c.1.b above, is staff's professional judgement that free available chlorine limitations are not warranted given total residual chlorine limitations are more stringent.

Total Chromium:
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15(a)(10)(i) – NSPS and 40 CFR 423.13(d)(1) – BAT. Both sections state that the quantity of pollutants discharged in cooling tower blowdown shall not exceed the quantity determined by multiplying the flow of cooling tower blowdown times the maximum concentration of 0.2 mg/L and the average concentration of 0.2 mg/L.

At the permitting authority's discretion (Federal Effluent Guidelines 40 CFR 423.15(a)(13), the quantity of pollutants allowed to be discharged may be expressed as a concentration limitation instead of the mass based limitation specified in paragraph 423.15(a)(10)(i). It is staff's professional judgement that applying the maximum concentration of 0.2 mg/L and the average concentration of 0.2 mg/L to the discharge is appropriate and allows for comparison to the Virginia WQS for Chromium which are established in concentration units.

Because the facility has not discharged since 2006, there is no discharge data available. As such, it is staff's professional judgement that applying the Federal Effluent requirements, a maximum concentration of 0.2 mg/L and the average concentration of 0.2 mg/L, to the discharge is appropriate. A daily maximum limit of 0.2 mg/L and a monthly average limit of 0.2 mg/L shall be carried forward with this reissuance. Because the facility has not discharged since 2006, staff proposes a change to the monitoring frequency from once per month (1/M) to contingent upon discharge, not to exceed once in a given calendar month.

Total Zinc:
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15(a)(10)(i) – NSPS and 40 CFR 423.13(d)(1) – BAT. Both sections state that discharges from cooling tower blowdown shall not exceed the quantity determined by multiplying the flow of cooling tower blowdown times the maximum concentration of 1.0 mg/L and the average concentration of 1.0 mg/L. Given the requirements are the same for both sections of the rule, it is staff's professional judgement that the basis for the limitation be based on the NSPS to provide consistency with rationale utilized in past reissuances.

At the permitting authority's discretion (Federal Effluent Guidelines (40 CFR 423.15(a)(13)), the quantity of pollutants allowed to be discharged may be expressed as a concentration limitation instead of the mass based limitation specified in paragraph 423.15(a)(10)(i). It is staff's professional judgement that applying the maximum concentration of 1.0 mg/L and the average concentration of 1.0 mg/L to the discharge is appropriate and allows for comparison to the Virginia WQS for Zinc which are established in concentration units.

Because the facility has not discharged since 2006, there is no discharge data available. As such, it is staff's professional judgement that applying the Federal Effluent requirements, a maximum concentration of 1.0 mg/L and the average concentration of 1.0 mg/L, to the discharge is appropriate. A daily maximum limit of 1.0 mg/L and a monthly average limit of 1.0 mg/L shall be carried forward with this reissuance. Because the facility has not discharged since 2006, staff proposes a change to the monitoring frequency from once per month (1/M) to contingent upon discharge, not to exceed once in a given calendar month.

126 Priority Pollutants:
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15(a)(10)(i) – NSPS and 40 CFR 423.13(d)(1) – BAT. Both sections state that the quantity of pollutants in cooling tower blowdown discharges (Appendix A to Part 423) shall be in non-detectable amounts. Given the requirements are the same for both sections of the rule, it is staff's professional judgement that the basis for the limitation be based on the NSPS to provide consistency with rationale utilized in past reissuances. As such, the daily maximum and monthly average non-detectable limits shall be carried forward. Because the facility has not discharged since 2006, staff proposes a change to the monitoring frequency to contingent upon discharge not to exceed once per calendar year.

At the permitting authority's discretion (40 CFR 423.15(a)(10)(iii)), compliance with the limitations for the 126 priority pollutants may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR Part 136.

d. Low Volume Waste, Flue Gas Desulfurization Wastewater, Flue Gas Mercury Control Wastewater, Combustion Residual Leachate, and Gasification Wastewater

1. Low Volume Waste

Total Suspended Solids (TSS):
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15 – NSPS and 40 CFR 423.13 – BAT. Low volume waste requirements are only addressed within 40 CFR 423.15(a)(3). As such, the basis for the limitation would be based on the NSPS. 40 CFR 423.15(a)(3) states that the quantity of pollutants discharged in low volume waste sources shall not exceed the quantity determined by multiplying the flow of low volume waste sources times the maximum concentration of 100 mg/L and the average concentration of 30 mg/L.

However, with this reissuance staff has proposed more stringent TSS limits based on the requirements associated with coal pile runoff (See Section 17.c.1.a of the Fact Sheet). With this reissuance staff proposes a change to the daily maximum TSS limit from 100 mg/L to 50 mg/L to be consistent with the Federal Effluent Guidelines found within 40 CFR 423.15(a)(11). Staff believes that should a discharge occur, the facility could meet a more stringent limit of 50 mg/L. The monthly average TSS limit of 30 mg/L shall remain in place. Because the facility has not discharged since 2006, staff proposes a change to the monitoring frequency from once per month (1/M) to contingent upon discharge, not to exceed once in a given calendar month.

Oil and Grease (O&G):
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15 – NSPS and 40 CFR 423.13 – BAT. Low volume waste requirements are only addressed within 40 CFR 423.15(a)(3). As such, the basis for the limitation would be based on the NSPS. 40 CFR 423.15(a)(3) states that the quantity of pollutants discharged in low volume waste sources shall not exceed the quantity determined by multiplying the flow of low volume waste sources times the maximum concentration of 20 mg/L and the average concentration of 15 mg/L.

At the permitting authority's discretion (Federal Effluent Guidelines 40 CFR 423.15(a)(13), the quantity of pollutants allowed to be discharged may be expressed as a concentration limitation instead of the mass based limitation specified in paragraph 423.15(a)(3). It is staff's professional judgement that applying the maximum concentration of 20 mg/L and the average concentration of 15 mg/L to the discharge is appropriate and is consistent with those established in previous reissuances. Because the facility has not discharged since 2006, staff proposes a change to the monitoring frequency from once per month (1/M) to contingent upon discharge, not to exceed once in a given calendar month.

2. Flue Gas Desulfurization Wastewater
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15 – NSPS and 40 CFR 423.13– BAT. 40 CFR 423.15(a)(3) – NSPS establishes limitations for TSS and Oil and Grease (O&G), while 40 CFR 423.13 (g)(1)(i) – BAT establishes limitations for Arsenic, Mercury, Selenium and Nitrate+Nitrite.

Because this particular waste stream does not exist at the facility, it is staff's professional judgement that limitations based on this specific waste stream are not warranted. To address any future operational changes that might result in the generation of flue gas desulfurization wastewater, a requirement prohibiting the discharge of flue gas desulfurization wastewater shall be implemented with this reissuance.

3. Flue Gas Mercury Control Wastewater
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15 – NSPS and 40 CFR 423.13– BAT. 40 CFR 423.15(a)(3) – NSPS establishes limitations for TSS and O&G, while 40 CFR 423.13 (h)(1)(i) – BAT establishes a no discharge of pollutants in flue gas mercury control wastewater.

While this particular waste stream does not exist at the facility, it is staff's professional judgement that a requirement prohibiting the discharge of flue gas mercury control wastewater be implemented with this reissuance.

4. Combustion Residual Leachate
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15 – NSPS and 40 CFR 423.13– BAT. 40 CFR 423.15(a)(3) – NSPS establishes limitations for TSS and O&G, while 40 CFR 423.13 (l) – BAT establishes a limitation for TSS based on the concentration listed in 40 CFR 423.12(b)(4).

Because the facility does not have coal ash ponds on site, this particular waste stream does not exist. As such, it is staff's professional judgement that limitations based on this specific waste stream are not warranted. To address any future operational changes that might result in the generation of combustion residual leachate, a requirement prohibiting the discharge of combustion residual leachate shall be implemented with this reissuance.

5. Gasification Wastewater
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15 – NSPS and 40 CFR 423.13– BAT. 40 CFR 423.15(a)(3) – NSPS establishes limitations for TSS and O&G, while 40 CFR 423.13 (j)(1)(i) – BAT establishes limitations for Arsenic, Mercury, Selenium and Total Dissolved Solids.

Because this particular waste stream does not exist at the facility, it is staff's professional judgement that limitations based on this specific waste stream are not warranted. To address any future operational changes that might result in the generation of gasification wastewater, a requirement prohibiting the discharge of gasification wastewater shall be implemented with this reissuance.

e. Chemical Metal Cleaning Wastes

Total Copper:
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15(a)(4) – NSPS and 40 CFR 423.13(e) – BAT. Both sections state the quantity of pollutants discharged in chemical metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of chemical metal cleaning wastes times the maximum concentration of 1.0 mg/L and the average concentration of 1.0 mg/L.

As noted in the Fact Sheet for the previous reissuance, the facility changed its chemical metal cleaning operations to prevent discharges from such operations to the recycled water stream. Additionally, the previous permit contained a special condition prohibiting the discharge of chemical metal cleaning wastes from Outfall 001. This special condition shall be replaced by a requirement prohibiting the discharge of chemical metal cleaning wastes. As such, it is staff's professional judgement that limitations for total copper based on this specific waste stream are not warranted.

Total Iron:
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15(a)(4) – NSPS and 40 CFR 423.13(e) – BAT. Both sections state that the quantity of pollutants discharged in chemical metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of chemical metal cleaning wastes times the maximum concentration of 1.0 mg/L and the average concentration of 1.0 mg/L.

As noted in the Fact Sheet for the previous reissuance, the facility changed its chemical metal cleaning operations to prevent discharges from such operations to the recycled water stream. Additionally, the previous permit contained a special condition prohibiting the discharge of chemical metal cleaning wastes from Outfall 001. This special condition shall be replaced by a requirement prohibiting the discharge of chemical metal cleaning wastes. As such, it is staff's professional judgement that limitations for total iron based on this specific waste stream are not warranted.

Total Suspended Solids (TSS):
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15(a)(4) – NSPS and 40 CFR 423.13(e) – BAT. Requirements for TSS are only found within 40 CFR 423.15(a)(4) – NSPS. This section states that the quantity of pollutants discharged in chemical metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of chemical metal cleaning wastes times the maximum concentration of 100 mg/L and the average concentration of 30 mg/L.

As noted in the Fact Sheet for the previous reissuance, the facility changed its chemical metal cleaning operations to prevent discharges from such operations to the recycled water stream. Additionally, the previous permit contained a special condition prohibiting the discharge of chemical metal cleaning wastes from Outfall 001. This special condition shall be replaced by a requirement prohibiting the discharge of chemical metal cleaning wastes. As such, it is staff's professional judgement that limitations for TSS based on this specific waste stream are not warranted.

Oil and Grease (O&G):
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15(a)(4) – NSPS and 40 CFR 423.13(e) – BAT. Requirements for O&G are only found within 40 CFR 423.15(a)(4) – NSPS. This section states that the quantity of pollutants discharged in chemical metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of chemical metal cleaning wastes times the maximum concentration of 20 mg/L and the average concentration of 15 mg/L.

As noted in the Fact Sheet for the previous reissuance, the facility changed its chemical metal cleaning operations to prevent discharges from such operations to the recycled water stream. Additionally, the previous permit contained a special condition prohibiting the discharge of chemical metal cleaning wastes from Outfall 001. This special condition shall be replaced by a requirement prohibiting the discharge of chemical metal cleaning wastes. As such, it is staff's professional judgement that limitations for O&G based on this specific waste stream are not warranted.

f. Bottom Ash Transport Water

Total Suspended Solids:
In accordance with the revised rule, staff compared the requirements found within 40 CFR 423. bottom ash transport water shall not exceed the quantity determined by multiplying the flow of bottom ash transport water times the maximum concentration of 1.0 mg/L and the average concentration of 1.0 mg/L.

The previous permit contained a special condition prohibiting the discharge of bottom ash transport water from Outfall 001. This special condition shall be replaced by a requirement prohibiting the discharge of bottom ash transport water. As such, it is staff's professional judgement that limitations for TSS based on this specific waste stream are not warranted.

g. Temperature

Heat Rejection:
The parameter "Heat Rejection" is defined as the rate of heat transfer from a unit's condenser to its circulating water system. In general, it is the amount of energy (heat) produced minus the amount converted to electricity. The efficiency at which a plant can generate electric energy is primarily dependent upon the temperature and pressure of the steam generated and this directly affects the amount of energy lost as waste heat to the environment.

Virginia's Water Quality Criteria defines temperature requirements for the receiving stream. The rise above natural (background) temperature and maximum hourly temperature change due to point source discharges are limited by 9VAC25-260-60 and 9VAC25-260-70, respectively. Per these criteria, any rise above natural (background) temperature shall not exceed 3°C and the maximum hourly temperature change shall not exceed 2°C. This is monitored by calculating the heat rejection value of the discharge.

Since tidal dilution factors are not applicable to this calculation, staff elected to take a conservative approach and use the free flowing 1Q10 flow volume in the following equation as a means of calculating heat rejection.

$H = (M/T)\ (C_p)\ (\Delta T)$

Where:

M/T = $(P)\ (Q_s)$
P = 8.34 lbs per gallon
Q_s = 1Q10 critical stream flow
C_p = 1.0 BTU per lb. per degree F
ΔT = 2°C = 3.6°F (maximum hourly temperature change per 9VAC25-260-70)

The previous permit established the allowable heat input of the discharge as 3.55×10^7 BTU/hr. Because the calculation is based on critical stream flow, staff re-evaluted stream flows with this reissuance and found no significant difference from those used to determine the previous allowable heat input. As such, the 1Q10 from the previous reissuance (28.4 MGD) was used within the equation.

Therefore:

H = 8.34 lb/gal x 28.4 MGD x 1.0 BTU/lb-F x 3.6°F
= 8.53×10^8 BTU/day
= 3.55×10^7 BTU/hr

With this reissuance, the heat rejection limit of 3.55×10^7 BTU/hr shall be carried forward. This value is protective of the requirements defined in the Water Quality Criteria cited above.

h. pH

In accordance with the revised rule, staff compared the requirements found within 40 CFR 423.15 – NSPS and 40 CFR 423.13– BAT. Requirements for pH are only found within 40 CFR 423.15(a)(1) – NSPS. This section states that the pH of all discharges, except once through cooling water, shall be within the range of 6.0 S.U. – 9.0 S.U. Additionally, water quality criteria states that pH shall be a minimum value of 6.0 S.U. and a maximum value of 9.0 S.U. Because the pH range is the same for both the Federal Effluent Guidelines and the water quality criteria, the previously established minimum limit of 6.0 S.U. and the maximum limit of 9.0 S.U. shall be carried forward with this reissuance. Because the facility has not discharged since 2006, staff proposes a change to the monitoring frequency from once per month (1/M) to contingent upon discharge, not to exceed once in a given calendar month.

i. Nutrient Monitoring

EPA's Chesapeake Bay TMDL (December 29, 2010) included wasteload allocations for VPDES permitted industrial stormwater facilities as part of the regulated stormwater aggregate load. EPA used data submitted by Virginia with the Phase I Chesapeake Bay TMDL Watershed Implementation Plan (WIP), including the number of industrial stormwater permits per county and the number of urban acres regulated by industrial stormwater permits, as part of their development of the aggregate load. Aggregate loads for industrial stormwater facilities were appropriate because actual facility loading data were not available to develop individual facility wasteload allocations. Virginia estimated the loadings from industrial stormwater facilities using actual and estimated facility acreage information, and Total Phosphorus (TP), Total Nitrogen (TN), and Total Suspended Solids (TSS) loading values from the Northern Virginia Planning District Commission (NVPDC) Guidebook for Screening Urban Nonpoint Pollution Management Strategies, prepared for the Metropolitan Washington Council of Governments (November, 1979).

To protect the Water Quality Standards of the Chesapeake Bay, monitoring for Nitrate+Nitrite, Total Kjeldahl Nitrogen (TKN), Total Nitrogen (TN), and Total Phosphorus (TP) shall be carried forward with this reissuance. The monthly average total phosphorus effluent limitation of 2 mg/L shall also be carried forward. Actual facility area information and the TP and TN data required in this section, as well as the TSS data required elsewhere within this permit, will be used by the Board to quantify the nutrient and sediment loads from VPDES permitted industrial facilities, and will be submitted to EPA to aid them in further refinements to their Chesapeake Bay TMDL model. The loading information will also be used by the board to determine any additional load reductions needed for industrial facilities for the next reissuance of this permit. See Part I.E of the permit for additional calculation and reporting requirements.

With this reissuance staff is proposing to remove the monthly average total phosphorus limitation of 2 mg/L. This limitation is typically applied to discharges from sewage treatment plants where phosphorus controls are not in place. This limit has been shown to provide sufficient control on phosphorus to avoid nuisance algal blooms in ponds, small impoundments, and still waters in general. Given this is an industrial discharge to the Rappahannock River, it is staff's professional judgement that the basis for the limitation is not appropriate. Additionally, monitoring for phosphorus without limitation, is consistent with current agency practice for VPDES permitted industrial facilities. Staff believes there is no reasonable potential for the removal of this limit to create any instream excursion of any applicable State narrative or numerical Water Quality Standard.

j. Stormwater Management Requirements

This facility's two storm water runoff ponds were designed to control at a minimum, the 10-year, 24-hour rainfall runoff event. All storm water within the entire plant area is collected and routed to either runoff pond "A" or "B" and reused as process make-up water.

Because all storm water from within the industrial site is captured and eventually used as process water, there is no routine storm water discharge from the facility. As such, it is staff's professional judgement that storm water monitoring requirements are not necessary.

k. Effluent Limitations and Monitoring Summary

Effluent limitations and monitoring requirements for Outfall 001 are presented in Section 19 of the Fact Sheet. When applicable, both water quality based limits and Federal Effluent Guideline requirements were compared. The most stringent limitation was used as the basis for the final limit.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

18. Antibacksliding:

a. pH Excursion Limits

An individual pH excursion limit of 60 minutes and a total pH excursion limit of 446 minutes had previously been applied to the discharge from Outfall 001. 40 CFR Part 401.17 defines an excursion as an unintentional and temporary incident in which the pH value of the discharged wastewater exceeds the range set forth in the applicable effluent limitations guideline. 40 CFR Part 401.17 provides for acceptable excursions from the pH range set forth within the applicable federal effluent limitation provided the permittee continuously measures pH pursuant to a requirement in a NPDES (VPDES) permit. When developed these excursions were appropriate based on the continuous nature of the discharge.

It is staff's opinion that this change is appropriate given the facility has not discharged since 2006 and any potential discharge would be intermittent in nature lasting twenty-four hours or less. Staff believes there is no reasonable potential for the removal of these limits to create any instream excursion of any applicable State narrative or numerical Water Quality Standard. Rather, staff believes the removal of the individual and total pH excursion limits makes the draft permit more protective.

b. Temperature Excursion Limits

An individual temperature excursion limit of 60 minutes and a total temperature excursion limit of 446 minutes had previously been applied to the discharge from Outfall 001. These limitations were based on best professional judgment in that short term excursions, occurring less than 1% of the operating time, beyond the established temperature limitations would not negatively impact water quality. When developed these excursions were appropriate based on the continuous nature of the discharge.

It is staff's opinion that this change is appropriate given the facility has not discharged since 2006 and any potential discharge would be intermittent in nature lasting twenty-four hours or less. Staff believes there is no reasonable potential for the removal of these limits to create any instream excursion of any applicable State narrative or numerical Water Quality Standard. Rather, staff believes the removal of the individual and total temperature excursion limits makes the draft permit more protective.

19. Effluent Limitations/Monitoring Requirements: Outfall 001

Average flow is 0.0 MGD.
Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.
Prohibitions: There shall be no discharge of chemical metal cleaning wastewaters, boiler bottom ash transport water, fly ash transport water, combustion residual leachate, flue gas desulfurization wastewater, flue gas mercury control wastewater, and/or gasification wastewater.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Daily Maximum	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Contingent	Estimate
pH	1a,3	NA	NA	6.0 S.U.	9.0 S.U.	Contingent	Grab
Heat Rejection (BTU/hr)	2	NA	NA	NA	$3.55x10^7$	Continuous	Calculated
Total Residual Chlorine	3	NA	0.016 mg/L	NA	NA	Contingent	Grab
Total Suspended Solids (TSS)	1b,1d,1e	30 mg/L	50 mg/L	NA	NA	Contingent	Grab
Oil and Grease (O&G)	1b,1e	15 mg/L	20 mg/L	NA	NA	Contingent	Grab
Total Nitrogen[a]	2	NL (mg/L)	NA	NA	NA	Contingent	Calculated
Total Kjeldahl Nitrogen (TKN)	2	NL (mg/L)	NA	NA	NA	Contingent	Grab
Nitrate+Nitrite	2	NL (mg/L)	NA	NA	NA	Contingent	Grab
Total Phosphorus	2	2.0 mg/L	NL (mg/L)	NA	NA	Contingent	Grab
Chromium, Total Recoverable	1c,1e	0.2 mg/L	0.2 mg/L	NA	NA	Contingent	Grab
Zinc, Total Recoverable	1c,1e	1.0 mg/L	1.0 mg/L	NA	NA	Contingent	Grab
Acute Toxicity – *C. dubia* (NOAEC)	2	NA	NA	NA	NL (%)	1/D-YR	24H-C
Acute Toxicity – *P. promelas* (NOAEC)	2	NA	NA	NA	NL (%)	1/D-YR	24H-C
126 Priority Pollutants (Appendix A of 40 CFR 423)	1c	Non-detectable	Non-detectable	NA	NA	1/D-YR	Grab

The basis for the limitations codes are:

1. Federal Effluent Requirements
   a) 40 CFR 423.15(a)(1)
   b) 40 CFR 423.15(a)(3)
   c) 40 CFR 423.15(a)(10)(i)
   d) 40 CFR 423.15(a)(11)
   e) 40 CFR 423.15(a)(13)
2. Professional judgement
3. Water Quality Standards

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.

Contingent = Once per discharge not to exceed once in a given calendar month.
1/D-YR = Once per year in which there is a discharge.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.
Estimate = Reported flow is to be based on the technical evaluation of the sources contributing to the discharge
24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored 24-hour period Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by ≥10% or more during the monitored discharge

Total Nitrogen Requirements.

a Total Nitrogen is the sum of Total Kjeldahl Nitrogen and NO_2+NO_3 and shall be calculated from the results of those tests.

Federal Effluent Requirements:

a. 40 CFR 423 15(a)(1) – The pH of all discharges, except once through cooling water, shall be within the range of 6.0 S.U. – 9.0 S.U
b. 40 CFR 423 15(a)(3) - NSPS low volume waste sources establishing daily maximum and monthly average limitations for O&G and TSS.
c. 40 CFR 423 15(a)(10)(i) – NSPS cooling tower blowdown establishing daily maximum and monthly average limitations for Total Chromium and Total Zinc and non-detectable amounts for the 126 Priority Pollutants.
d. 40 CFR 423.15(a)(11) - NSPS coal pile establishing a maximum limitation for TSS.
e. 40 CFR 423.15(a)(13) – NSPS quantity of pollutants allowed to be discharged may be expressed as a concentration limitation instead of a mass based limitation

20. Other Permit Requirements:

a. Permit Section Part I.B contains quantification levels and compliance reporting instructions.
9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

b. Permit Section Part I.C details the requirements for Whole Effluent Toxicity (WET) Program.
Whole Effluent Toxicity (WET) refers to the aggregate toxic effect to aquatic organisms from all pollutants present within a facility's wastewater effluent. This program is one approach to comply with the Clean Water Act's prohibition of the discharge of toxic pollutants in toxic amounts. WET testing allows for the measurement of the wastewater's potential effects on specific test organism's ability to survive, grow and reproduce.

The VPDES Permit Regulation at 9VAC25-31-220.D.1.a-d. requires limitations in permits to provide for and ensure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. Limitations must control all pollutants or pollutant parameters which the Board determines are or may be discharged at a level which will cause, have the reasonable potential to cause or contribute to an excursion above any Virginia water quality standard, including narrative criteria. The determination whether a discharge causes or contributes to an instream excursion above a narrative or numeric criteria shall utilize procedures which account for existing controls on sources of pollution, variability of the pollutant, species sensitivity and dilution of the effluent in the receiving stream. If it is determined that a reasonable potential exists to cause or contribute to an instream excursion of narrative criterion of the water quality standard, the permit must contain effluent limits for whole effluent toxicity. However, limits may not be necessary when it is demonstrated that chemical-specific limits are sufficient to attain and maintain applicable numeric and narrative water quality standards.

A WET Program is imposed for industrial facilities based on the facility's Standard Industrial Classification (SIC) code, instream waste concentration (IWC) and/or those required by the Board based on effluent variability, compliance history, existing treatment processes and/or the receiving stream characteristics.

Attachment 10 documents the calculated compliance endpoints that will be proposed with this reissuance.

c. Permit Section Part I.D details the requirements for Cooling Water Intake Structures at Existing VPDES Facilities.
Section 316(b) of the Clean Water Act requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. The United States Environmental Protection Agency (EPA) promulgated regulations in 2001, 2003, 2006, and 2014 to implement requirements of §316(b) in three phases. Final EPA Phase II regulations were published in the Federal Register on August 15, 2014, and became effective October 14, 2014.

d. Permit Section Part I.E details the requirements of Chesapeake Bay TMDL Monitoring.
To protect the Water Quality Standards of the Chesapeake Bay, monitoring for Nitrate+Nitrite, Total Kjeldahl Nitrogen (TKN), Total Nitrogen (TN), and Total Phosphorus (TP) are included with this reissuance. Actual facility area information and the TP and TN data required in this section, as well as the TSS data required elsewhere within this permit, will be used by the Board to quantify the nutrient and sediment loads from VPDES permitted industrial facilities, and will be submitted to EPA to aid them in further refinements to their Chesapeake Bay TMDL model. The loading information will also be used by the board to determine any additional load reductions needed for industrial facilities for the next reissuance of this permit.

21. Polychlorinated Biphenyls (PCBs):

The tidal Rappahannock River, on which Outfall 001 is located, is listed with a PCB impairment. In support of PCB TMDL that is development for the tidal Rappahannock River, this facility is a candidate for low-level PCB monitoring, based upon its designation as a minor industrial discharger. If this facility does discharge, DEQ staff recommends that this facility perform low-level PCB monitoring during the upcoming permit cycle. It is recommended that this facility collect 2 samples using EPA Method 1668, which is capable of detecting low-level concentrations for all 209 PCB congeners. PCB data generated using Method 1668 revisions A, B, C are acceptable, however data generated using version "A" is preferred.

Because of the trace analytical QLs, this sampling is not intended to evaluate compliance with the Federal Effluent Guideline prohibition on the discharge of PCBs. Rather, it is intended to better understand and characterize potential PCB discharges at the facility.

22. 316(b):

As noted above in Section 20.c, final Phase II regulations were published in the Federal Register on August 15, 2014, and became effective October 14, 2014. The facility maintains and utilizes an intake structure located on the north bank of the Rappahannock River. Two buried 24-inch diameter intake pipes extend approximately 100 feet into the Rappahannock River. Withdrawal is authorized under a Virginia Water Protection Permit (91-1692) which was reissued in 2006. A detailed description of the facility's intake structure is provided in Attachment 11.

Because the facility maintains and utilizes a cooling water intake structure, staff must evaluate the facility for purposes of §316(b) applicability. The §316(b) requirements are applicable if the facility meets all the following criteria as outlined in 40 CFR §125.91(a)(1) through (3):

- The facility is a point source (i.e., subject to a VPDES individual or general permit);
- The facility uses or proposes to use one or more cooling water intake structures with a cumulative design intake flow of greater than 2 MGD to withdraw waters of the United States; and
- Twenty-five percent of more of the water the facility withdraws on an actual intake flow basis is used exclusively for cooling purposes.

Information provided by the facility in September 2014 (Attachment 11), indicates that the facility has a design intake flow of 6.6 MGD and utilizes at least twenty-five percent of the water that is withdrawn exclusively for cooling purposes. Because the facility maintains a VPDES permit as a point source discharger despite not having discharged since 2006, and meets the other criteria outlined in 40 CFR §125.91(a)(1) through (3), it is staff's professional judgement that the final Phase II requirements are applicable.

Based on the above determination, Part I.D of the permit shall contain the following special conditions which apply to the water withdrawal.

a. Interim §316(b) Best Technology Available (BTA).
VPDES Permit Regulation 9VAC25-31-165.C requires existing facilities with cooling water intake structures to meet the requirements under §316(b) of the Clean Water Act (CWA) determined by the department on a case-by-case, best professional judgment basis. DEQ staff have determined the permitted facility to be subject to the §316(b) requirements because it is a point source that uses or proposes to use one or more cooling water intake structures that withdraws waters of the U.S. for cooling purposes.

b. Impingement and Entrainment Control Technology Preventative Maintenance.
VPDES Permit Regulation 9VAC25-31-190.E requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit.

c. Alternate Schedule for Submittal of 40 CFR §122.21(r) Information.
VPDES Permit Regulation 9VAC25-31-165.C requires existing facilities with cooling water intake structures to meet the requirements under §316(b) of the Clean Water Act (CWA) determined by the department on a case-by-case, best professional judgment (BPJ) basis.

In the case of permits issued after October 14, 2014, and applied for before October 14, 2014, federal regulations at 40 CFR §125.98(b)(6) allow for the Director to include permit conditions to ensure the Director will have all the information under 40 CFR §122.21(r) necessary to establish impingement mortality and entrainment BTA requirements

under 40 CFR §§ 125.94(c) and 125.94(d) for the subsequent permit. The Director must establish interim BTA requirements in the permit on a site-specific basis based on the Director's best professional judgment in accordance with 40 CFR §125.90(b) and 40 CFR §401.14.

Federal regulations at 40 CFR §125.98(a) requires the review, for completeness, of the materials submitted by the applicant under 40 CFR §122.21(r) at the time of any application for a subsequent permit. To facilitate a determination of a timely and complete reissuance application in compliance with Part II.M of this permit, the Alternate Schedule for this facility has been established to require submission of the 40 CFR §122.21(r) information to the DEQ-Regional Office by no later than 270 days prior to the expiration date of this permit.

d. Visual or Remote Inspections.
VPDES Permit Regulation 9VAC25-31-210.A authorizes the Board to establish permit conditions to provide for and assure compliance with all applicable requirements of the law, the CWA and regulations. Federal regulations at 40 CFR §125.96(e) requires visual inspections or the employment of remote monitoring devices to be conducted at least weekly during the period any cooling water intake structure is in operation to ensure any technologies operated are maintained and operated to function as designed, including those installed to protect Federally-listed threatened or endangered species or designated critical habitat.

40 CFR §125.96 authorizes DEQ to establish monitoring requirements, and specific protocols, as appropriate. Provisions for inspection waivers, adverse weather conditions, and deficiency discoveries were developed, using as a foundation, comparable provisions found in the VPDES General Permit for Stormwater Discharges Associated with Industrial Activity, 9 VAC 25-151-70, Part I.A.2.e, A.3 and A.6.b.

e. Annual Certification Statement Requirements.
VPDES Permit Regulation 9VAC25-31-210.A authorizes the Board to establish permit conditions to provide for and assure compliance with all applicable requirements of the law, the CWA and regulations. Federal regulations at 40 CFR §125.97(c) requires the permittee to annually submit a certification statement signed by a responsible corporate officer reporting whether there have been substantial modifications to the operation at any unit at the facility that impacts cooling water withdrawals or operation of the cooling water intake structures, or if information contained in the previous year's annual certification remains pertinent.

f. Measures to Protect Federally-Listed Threatened or Endangered (T&E) Species, Designated Critical Habitat, and Fragile Species or Shellfish.
VPDES Permit Regulation 9VAC25-31-330 authorizes the board to include conditions in the permit in response to advice submitted in writing to the DEQ from the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, or any other state or federal agency with jurisdiction over fish, wildlife, or public health that the imposition of specified conditions are necessary to avoid substantial impairment of fish, shellfish, or wildlife resources and to the extent the board determines the conditions are necessary to carry out the provisions of the regulation, the law and of the CWA.

In addition, VPDES Permit Regulation 9VAC25-31-165.C requires existing facilities with cooling water intake structures to meet requirements under section 316(b) of the Clean Water Act determined by the department on a case-by-case, best professional judgment (BPJ) basis. 40 CFR §§125.94(a)(1), 125.94(g), 125.96(g), and 125.97(g) authorize DEQ to establish additional control measures, monitoring, and reporting requirements in the permit designed to minimize incidental take, reduce or remove more than minor detrimental effects to Federally-listed threatened or endangered species or designated critical habitat, or avoid jeopardizing Federally-listed species or destroying or adversely modifying designated critical habitat (e.g. prey base).

State Water Control Law §62.1-44.5.A.3 and VPDES Permit Regulation 9VAC25-31-50.A.2 prohibits the alteration of the physical, chemical or biological properties of State waters and making them detrimental to animal or aquatic life, except in compliance with a permit issued by the Board. In addition, VPDES Permit Regulation 9VAC25-31-190.E requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit.

State Water Control Law §62.1-44.21 and VPDES Permit Regulation 9VAC25-31-190.H authorizes the Board to require owners to furnish plans, specifications, and other pertinent information as may be necessary to accomplish the purposes of the State Water Control Law. In addition, federal regulations at 40 CFR §125.94(g) and §125.97(e) authorize DEQ to establish additional permit monitoring and reporting requirements. Information provided by the permittee under this special condition may be used as a foundation to address other reporting requirements of 40 CFR §125.98(k).

g. Federal Endangered Species Act Compliance.
State Water Control Law §62.1-44.5.A.3 and VPDES Permit Regulation 9VAC25-31-50.A.2 prohibits the alteration of the physical, chemical or biological properties of State waters and making them detrimental to animal or aquatic life, except in compliance with a permit issued by the Board.

In addition, VPDES Permit Regulation 9VAC25-31-210.A authorizes the Board to establish permit conditions to provide for and assure compliance with all applicable requirements of the law, the CWA and regulations. 40 CFR §125.98(j) stipulates that nothing in Subpart J of Part 125 of the Code of Federal Regulations authorizes the take, as defined at 16 U.S.C. 1532(19), of threatened or endangered species of fish or wildlife. Such take is prohibited under the Endangered Species Act unless it is exempted pursuant to 16 U.S.C 1536(o) or permitted pursuant to 16 U.S.C 1539(a). Absent such exemption or permit, any facility must not take threatened or endangered species. 40 CFR §125.98(b)(1) requires all NPDES permits for facilities subject to §316(b) of the Clean Water Act to include as a permit condition the specific language of this special condition.

23. Groundwater Monitoring:

Groundwater monitoring has historically not been required for this facility. Staff has reviewed early permitting documentation, and rationale for this decision was based on the fact that the coal pile runoff pond, the coal storage area, and the raw water storage pond were lined. Also, stormwater flow from the coal storage area is directed to the coal pile runoff pond via concrete drainage ditches thereby minimizing any potential impact to groundwater. Additionally, a direct discharge of coal pile runoff water into the cooling tower was removed. These factors combined mitigated the requirement for groundwater monitoring.

Given the above conditions have not changed since the initial groundwater monitoring determination was made, it is staff's professional judgement that groundwater monitoring is not required.

24. Other Special Conditions:

a. O&M Manual Requirement. Required by Code of Virginia §62.1-44.16; VPDES Permit Regulation, 9VAC25-31-190.E and 40 CFR 122.41(e). The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

b. Notification Levels. Required by VPDES Permit Regulation 9VAC-31-200A for all manufacturing, commercial, mining, and silvacultural discharges. The permittee shall notify the Department as soon as they know or have reason to believe:
   1. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following notification levels:
      (a) One hundred micrograms per liter;
      (b) Two hundred micrograms per liter for acrolein and acrylonitrile; five hundred micrograms per liter for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter for antimony;
      (c) Five times the maximum concentration value reported for that pollutant in the permit application; or
      (d) The level established by the Board.

   2. That any activity has occurred or will occur which would result in any discharge, on a nonroutine or infrequent basis, of a toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following notification levels:
      (a) Five hundred micrograms per liter;
      (b) One milligram per liter for antimony;
      (c) Ten times the maximum concentration value reported for that pollutant in the permit application; or
      (d) The level established by the Board.

c. Materials Handling/Storage. 9VAC25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorize the Board to regulate the discharge of industrial waste or other waste.

d. Water Quality Criteria Reopener. The VPDES Permit Regulation at 9VAC25-31-220 D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

e. Water Quality Criteria Monitoring. State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. States are required to review data on discharges to identify actual or potential toxicity problems, or the attainment of water quality goals, according to 40 CFR Part 131, Water Quality Standards, subpart 131.11. To ensure that water quality criteria are maintained, the permittee is required to analyze the facility's effluent for the substances noted in Attachment A of this VPDES permit.

f. Prohibition of Chemical Additives. Chemical additives may not be used in the non-contact cooling water without prior notification to the Department of Environmental Quality - Northern Regional Office (DEQ-NRO). The chemical additives may be toxic or otherwise violate the receiving stream water quality standards. Upon notification, the Regional Office can determine if this activity will warrant a modification to the permit.

g. 126 Priority Pollutants. 40 CFR 423.15(a)(10)(i) requires that the permittee have non-detectable amounts of the 126 priority pollutants listed in Appendix A to 40 CFR 423 in their discharges. This pertains to chemicals added for cooling tower maintenance, in the blowdown discharge water. Sampling for these pollutants (except total chromium and total zinc) from the discharge point shall be conducted contingent upon a discharge, but no more than once per year. 40 CFR 423.15(a)(10)(iii) states that at the permitting authority's discretion, instead of monitoring, compliance with the standards for the 126 priority pollutants maybe be determined by engineering calculation which demonstrate that the regulated pollutants are not detectable in the final discharge, by the analytical methods in 40 CFR 136.

h. Polychlorinated Biphenyl. 40 CFR 423.15(a)(2) requires that there shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

i. Total Residual Chlorine. 40 CFR Part 423.15(a)(8)(i) - NSPS establishes limitations for Total Residual Chlorine. Since the facility may substitute bromine in place of chlorine, the permittee will be required to demonstrate that residual bromine levels do not exceed the NSPS requirements established for chlorine.

j. PCB Monitoring. The permittee shall conduct PCB monitoring using low-level PCB analysis to support the PCB TMDL for the fish consumption use impairment in the tidal Rappahannock River.

k. TMDL Reopener: This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may be developed and approved for the receiving stream.

Permit Section Part II. Required by VPDES Regulation 9VAC25-31-190, Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

25. Changes to the Permit from the Previously Issued Permit:

a. Special Conditions:

1. The 316(b) special condition was removed with this reissuance as these requirements have now been established within a separate section of the permit.
2. The separate special conditions for the prohibition of discharge of chemical metal cleaning wastewaters and boiler bottom ash transport water and fly ash transport water were removed. Rather a new requirement prohibiting the discharge of chemical metal cleaning wastewaters, boiler bottom ash transport water, fly ash transport water, combustion residual leachate, flue gas desulfurization wastewater, flue gas mercury control wastewater, and gasification wastewater has been added to Part I.A.1 of the permit.
3. The pH and Temperature Excursion special condition was removed with this reissuance as these excursions are no longer authorized by the permit.
4. A water quality criteria monitoring special condition was added to the permit with this reissuance for the purpose of obtaining data should the facility discharge.
5. The prohibition of chemical additives special condition was updated to reflect current agency language.
6. The polychlorinated biphenyl special condition was updated to reflect current agency language.
7. A special condition requiring low-level PCB monitoring at Outfall 001 was added with this reissuance based on the fish tissue impairment in the tidal Rappahannock River.

b. Monitoring and Effluent Limitations:

1. Because the facility does not discharge continuously, the frequency for flow monitoring was changed from continuous to contingent. Additionally, the sample type was changed from TIRE to estimate.
2. The Total Residual Chlorine limitation for Outfall 001 has been revised to 0.016 mg/L based on revised acute and chronic wasteload allocation determinations taking in to consideration the mixing zone study as noted in Section 17.b of the Fact Sheet.
3. The maximum Total Suspended Solids limitation for Outfall 001 has been revised from 100 mg/L to a maximum of 50 mg/L.
4. The individual pH excursion time of 60 minutes and the total pH excursion time of 446 minutes have been removed with this reissuance.
5. The individual temperature excursion time of 60 minutes and the total temperature excursion time of 446 minutes have been removed with this reissuance.

c. Other:

1. Part I.D of the permit has been established to address 316(b) requirements.
2. The NPDES Permit Rating Worksheet reflects a score change from 40 to 20 with this reissuance. The change results from updating Factor 1 to reflect the current discharge flow at the facility and updating Factor 6 to indicate the facility discharges to the Chesapeake Bay.
3. The Waterbody ID was updated from VAN-E21R to VAN-E21E.

26. Variances/Alternate Limits or Conditions: NA

27. Public Notice Information:

First Public Notice Date: August 11, 2016 Second Public Notice Date: August 18, 2016

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3853, susan.mackert@deq.virginia.gov. See Attachment 12 for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

28. Additional Comments:

Previous Board Action(s): None

Staff Comments:

1. Pursuant to 40 CFR §125.98(h) of the recent EPA Phase II §316(b) Rule, permit applications for facilities subject to the Rule are to be transmitted to the appropriate field office of the U.S. Fish and Wildlife Service (USFWS) and/or regional office of the National Marine Fisheries Service (NMFS) for a 60 day review period. Because this facility meets the requirements of §316(b), a copy of the 2014 permit application was submitted to the USFWS on August 31, 2015. Also, due to the presence of the federally endangered Atlantic Sturgeon in the receiving stream, a copy of the 2014 permit application was submitted to the USFWS on August 31, 2015. Additional information pertaining to the facility's intake design was provided to the USFWS on October 5, 2015, and to the NMFS on October 8, 2015.

   By email correspondence dated October 5, 2015, the USFWS indicated the permittee's cooling water intake structure already complies with their recommendations to minimize impacts to aquatic species. Therefore, the USFWS had no additional comments with respect to 316(b) coordination. No comments were received from NMFS during the 60 day review period.

2. On March 1, 2016, the Department of Environmental Quality Office of Water Supply issued a Groundwater Existing User permit (permit number GW00187EU) to Birchwood Power Partners, LP. An Existing User Permit is used for the initial permit for users that were in existence prior to the establishment of a Groundwater Management Area (GWMA). When the GWMA was expanded to the entire coastal plain in 2014 this facility became subject to a permit. Existing User permits are issued for 10 years based on historic use. Once this first permit is expanded or expires, the limit will be based on a demand justification and the impact to the aquifer.

   The permit authorizes the operation of existing groundwater wells for the continued operation of the power facility. The maximum monthly and annual authorized withdrawals from the Potomac Aquifer are 2 million and 7 million gallons, respectively. This permit will expire on February 28, 2025.

3. In accordance with 40 CFR §124.10(e) and 40 CFR §125.98(h), copies of the public notice and proposed draft permit and fact sheet were transmitted to the appropriate field office of the U.S. Fish and Wildlife Service (USFWS) and regional office of the National Marine Fisheries Service (NMFS) for review on August 18, 2016. Email correspondence dated September 9, 2016, from the USFWS indicated that they had no further comments. No correspondence was received from the NMFS prior to the close of the public comment period.

Public Comment: No comments were received during the public comment period.

Fact Sheet Attachments – Table of Contents

Birchwood Power Facility
VA0087645

2016 Reissuance

Birchwood Power Facility Water and Ash Process Descriptions

Water System Overview

The Birchwood Power Facility has been designed to minimize use of water from the Rappahannock River and groundwater. The site is further operated to minimize or eliminate discharges of treated wastewater. This is accomplished by treating collected water as needed or appropriate and reusing it as make-up water for various internal processes. Collectively, these practices reduce the demand for water from the Rappahannock River and from groundwater.

Water management has evolved since operations began in the mid 1990's. The Birchwood Power Facility operates as a "zero liquid discharge facility", and has not discharged water since 2006. The discharge of treated wastewater has been effectively eliminated, by beneficial reuse of wastewater streams wherever possible. For example, reverse osmosis reject and cooling tower blowdown water are reused by utilizing these wastewater streams as scrubber make-up water or recycled as process makeup water.

Water is withdrawn from the Rappahannock River and sent to the onsite 12-million gallon lined pond (Inlet Storage Pond). Facility process and cooling water is withdrawn from the Inlet Storage Pond. Also, water from the site runoff ponds (Storm Water Runoff Ponds "A" and "B") and the site's lined coal pile run-off pond can be diverted to the Inlet Storage Pond if needed.

All wastewater is collected in the Wastewater Basin and is recycled as process makeup water. Recycling of the plant's wastewater streams begins when water is pumped from the Wastewater Basin or discharged from the Recycle Clarifier to a storm drain drop inlet, whereupon it flows by gravity to Storm Water Runoff Pond "B". All water from Storm Water Runoff Pond "B", including all storm water runoff, collected from the site storm drain system and Storm Water Runoff Pond "A" is pumped back into the Inlet Storage Pond, where it is mixed with intake water from the Rappahannock River. All storm water from within the industrial site is captured and eventually used as process water.

Cooling tower blowdown water is the principle source of make-up water to the FGD (Flue Gas Desulfurization) Scrubber. If not used in the Scrubber, cooling tower blowdown water may also be conveyed directly to Storm Water Runoff Pond "B", and ultimately back to the Inlet Storage Pond. The closed loop transfer of all recycled process streams back to the Inlet Storage Pond allows the facility to maximize the reuse of process water, and negate the need to discharge back to the Rappahannock River.

A limited amount of recycled water is used to spray down roads, trucks, and our locomotive to remove ash/dirt. It is also periodically necessary to drain deionized water from the demineralizer trailer into the yard. Any runoff that occurs in the yard would be directed to the Storm Water Runoff Pond "B", pumped to the Inlet Storage Pond and from there recycled through the facility.

The facility uses a leased demineralizer trailer that is regenerated offsite, eliminating the generation of low pH and high pH regeneration wastewater from this process.

Inlet Storage Pond

The Inlet Storage Pond is a 60 mil HDPE lined pond which stores water for the facility makeup water and is mainly fed by withdrawal from the Rappahannock River. This pond has a total storage capacity of approximately 22.4 million gallons and an active pond storage of approximately 12 million gallons between the high and low pump settings. This pond also collects storm water from a small portion of the facility within the rail loop. The Inlet Storage Pond was designed to have zero discharge during a 10-year 24-hour rainfall event.

Coal Pile Runoff Pond

The Coal Pile Runoff Pond is a 60 mil HDPE lined pond that receives rainwater runoff from the 9 acre coal stockpile area by means of a concrete drainage ditch that directs flow into the pond. Waste lime slurry and lime water is directed to the concrete drainage ditch where it mixes with the coal pile runoff, which serves as a pretreatment. This water is typically of very low turbidity, having excellent clarity, slightly alkaline pH with an aquamarine blue color. Because of its high quality, coal pile runoff water is recycled.

The Coal Pile Runoff system consists of a lined pond and one vertical and one floating sump pump. The Coal Pile Runoff Pump system is sized to remove a 100-year rainfall event from the Coal Pile Runoff Pond and prepare for the next rainfall event within one month of the 100-year rainfall event (approximately 52 gpm). Periodically, the sludge is vacuumed out, dried and mixed with the ash product that is sent to the local landfill, following analytical testing to verify its nature as a non-hazardous substance.

Storm Water Runoff Pond "A"

Storm water runoff pond "A" collects storm water from the Northwestern side of the facility. It is located beyond the industrial area. This pond is not lined. It collects storm water from yard drains on the North side of the facility including the ditches along the main roadway. It is designed to collect runoff in excess of a 10-year 24-hour rainfall event. All water from this pond can be transferred to B Pond, then back to the Inlet Storage Pond, where it is mixed with intake water from the Rappahannock River.

Storm Water Runoff Pond "B"

Storm water runoff pond "B" collects storm water from approximately 26 acres of the facility. This pond is not lined, and was designed to retain storm water in excess of a 10-year 24-your rainfall event and to transfer the storm water via two pumps to the Inlet Storage Pond for facility usage.

All water from this pond, including all storm water runoff as collected from the site storm drain system and Storm Water Runoff Pond A is pumped back into the Inlet Storage Pond, where it is mixed with intake water from the Rappahannock River. All storm water from within the industrial site is captured and eventually used as process water.

Intake/Discharge Structure

The Birchwood permitted intake/discharge structure is located on the north bank of the Rappahannock River. Two pipelines, a 20-inch intake pipeline and a 12-inch discharge pipeline, carry water between the facility and the intake/discharge structure. The pipelines are buried for almost the entire length except for an aerial crossing of a small tributary to Birchwood Run.

There are two 24-inch diameter intake pipes extending approximately 100 feet into the Rappahannock River. These pipes are buried except for the intake opening at the terminal end. Each intake pump is rated at 5,000 gpm. The intake structure is a redundant system. Each intake is capable of withdrawing the maximum amount of water required. However, only one intake is operated at any one time. The top of the intake screens is approximately 10 feet below the water surface. Each intake screen is 66 inches in diameter and approximately 111 inches in length. The design intake velocity is 0.25 feet per second (ft/sec) with a mesh screen size of 1 millimeter (mm) to prevent impingement and entrainment of debris and aquatic life.

The mesh screen size and velocity of flow represent industry standards that are used by other recently permitted facilities. If cleaning of the intake screens is necessary, a measured burst of air inside the screen will force accumulated debris away from the screen to be carried away by the flow of the river. Intake flow is continuously monitored. The cleaning process is initiated when a reduction in flow is noted.

The 12-inch diameter discharge pipe is located approximately 20 feet upstream and 9 feet beyond the intake pipes. The discharge port is a nozzle design with a port diameter of 0.5 feet placed approximately 1.5 feet above the river bottom to minimize the mixing zone. However, it is important to note that the discharge system has not been in use since 2006.

Lime Spray Dryer (Scrubber)

The scrubber for the Birchwood Power Facility is a lime spray dryer that produces a dry waste product collected in a baghouse. The gaseous species of SO_2 and HCL are converted to calcium sulfite, calcium sulfate, and calcium chloride, all of which are solids.
This type of scrubber does not fully saturate the flue gas, and hence is a net water consumer. Water is evaporated in the scrubber and leaves in the form of water vapor. The intent is to maximize the usage of plant wastewater in the scrubber. There is no liquid waste stream from the scrubber. The scrubber normally receives makeup water to the slaker from the cooling tower blowdown. This water evaporates in the flue gas stream which results in dissolved and suspended solids becoming part of the scrubber's solid byproduct. The solid by-product is landfilled after demonstration that it is a non-hazardous substance.

Ash System Overview

There is no wastewater stream associated with bottom ash transport water. Water is not used in the fly ash transport system. We do not have once through cooling water. Instead, a cooling tower is used for closed loop cooling water. There are no ash storage ponds onsite. Fly ash is collected in the baghouse and pneumatically conveyed to an ash silo for temporary storage before hauling by truck to the King George Landfill.

Bottom ash comes from the bottom ash drag chain and is deposited in a rail car then transported onsite by locomotive to the lined coal pile for temporary storage until trucks haul to King George Landfill to be used as beneficial use daily cover.

The active and 30 day coal storage area was designed with a 3' compacted low permeability clay layer, underlain by 8-oz. geotextile filter fabric, 18" layer of #57 stone, and a 6' compacted clay base . The coal pile is used for storage of virgin coal and temporary storage of bottom ash until sufficient volume is collected to transport by truck to the King George Landfill.

NPDES PERMIT RATING WORK SHEET

[X] Regular Addition
[ ] Discretionary Addition
[ ] Score change, but no status Change
[ ] Deletion

VPDES NO. : VA0087645

Facility Name: Birchwood Power Facility
City / County: King George
Receiving Water: Rappahannock River
Waterbody ID: VAN-E21E

Is this facility a steam electric power plant (sic =4911) with one or more of the following characteristics?

1. Power output 500 MW or greater (not using a cooling pond/lake)
2 A nuclear power Plant
3 Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rater

[ ] Yes; score is 600 (stop here) [X] NO, (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

[ ] YES; score is 700 (stop here)
[X] NO; (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code. _____ Primary Sic Code: 4911 Other Sic Codes: _____ _____ _____

Industrial Subcategory Code. 000 (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
[X] No process waste streams	0	0	[ ] 3.	3	15	[ ] 7	7	35
[ ] 1	1	5	[ ] 4.	4	20	[ ] 8.	8	40
[ ] 2.	2	10	[ ] 5.	5	25	[ ] 9.	9	45
			[ ] 6.	6	30	[ ] 10.	10	50

Code Number Checked: 0
Total Points Factor 1: 0

FACTOR 2: Flow/Stream Flow Volume (Complete either Section A or Section B; check only one)

Section A – Wastewater Flow Only considered

Wastewater Type (see Instructions)			Code	Points
Type I:	Flow < 5 MGD	[ ]	11	0
	Flow 5 to 10 MGD	[ ]	12	10
	Flow > 10 to 50 MGD	[ ]	13	20
	Flow > 50 MGD	[ ]	14	30
Type II:	Flow < 1 MGD	[ ]	21	10
	Flow 1 to 5 MGD	[ ]	22	20
	Flow > 5 to 10 MGD	[ ]	23	30
	Flow > 10 MGD	[ ]	24	50
Type III:	Flow < 1 MGD	[ ]	31	0
	Flow 1 to 5 MGD	[ ]	32	10
	Flow > 5 to 10 MGD	[ ]	33	20
	Flow > 10 MGD	[ ]	34	30

Section B – Wastewater and Stream Flow Considered

Wastewater Type (see Instructions)	Percent of Instream Wastewater Concentration at Receiving Stream Low Flow		Code	Points
Type I/III:	< 10 %	[X]	41	0
	10 % to < 50 %	[ ]	42	10
	> 50%	[ ]	43	20
Type II.	< 10 %	[ ]	51	0
	10 % to < 50 %	[ ]	52	20
	> 50 %	[ ]	53	30

Code Checked from Section A or B: 41
Total Points Factor 2: 0

NPDES PERMIT RATING WORK SHEET

FACTOR 3: Conventional Pollutants

(only when limited by the permit)

A. Oxygen Demanding Pollutants. (check one) ☐ BOD ☐ COD ☐ Other. _____

Permit Limits: (check one)	Code	Points
☐ < 100 lbs/day	1	0
☐ 100 to 1000 lbs/day	2	5
☐ > 1000 to 3000 lbs/day	3	15
☐ > 3000 lbs/day	4	20

Code Number Checked: NA

Points Scored: 0

B Total Suspended Solids (TSS)

Permit Limits: (check one)	Code	Points
☐ < 100 lbs/day	1	0
☐ 100 to 1000 lbs/day	2	5
☐ > 1000 to 5000 lbs/day	3	15
☐ > 5000 lbs/day	4	20

Code Number Checked: NA

Points Scored: 0

C. Nitrogen Pollutants· (check one) ☐ Ammonia ☐ Other: _____

Permit Limits. (check one) *Nitrogen Equivalent*	Code	Points
☐ < 300 lbs/day	1	0
☐ 300 to 1000 lbs/day	2	5
☐ > 1000 to 3000 lbs/day	3	15
☐ > 3000 lbs/day	4	20

Code Number Checked· NA

Points Scored: 0

Total Points Factor 3: 0

FACTOR 4: Public Health Impact

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this include any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above reference supply.

☐ YES; (If yes, check toxicity potential number below)

☒ NO; (If no, go to Factor 5)

Determine the *Human Health* potential from Appendix A. Use the same SIC doe and subcategory reference as in Factor 1 (Be sure to use the *Human Health* toxicity group column – check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No process waste streams	0	0	☐ 3.	3	0	☐ 7	7	15
☐ 1.	1	0	☐ 4.	4	0	☐ 8.	8	20
☐ 2	2	0	☐ 5.	5	5	☐ 9.	9	25
			☐ 6	6	10	☐ 10	10	30

Code Number Checked· NA

Total Points Factor 4: 0

NPDES PERMIT RATING WORK SHEET

FACTOR 5: Water Quality Factors

A. *Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-base federal effluent guidelines, or technology-base state effluent guidelines), or has a wasteload allocation been to the discharge*

		Code	Points
[X]	YES	1	10
[ ]	NO	2	0

B. *Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?*

		Code	Points
[X]	YES	1	0
[ ]	NO	2	5

C. *Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?*

		Code	Points
[ ]	YES	1	10
[X]	NO	2	0

Code Number Checked: A 1 B 1 C 2

Points Factor 5: A 10 + B 0 + C 0 = **10**

FACTOR 6: Proximity to Near Coastal Waters

A Base Score: Enter flow code here (from factor 2) 41

Check appropriate facility HPRI code (from PCS):

	HPRI#	Code	HPRI Score
[ ]	1	1	20
[ ]	2	2	0
[X]	3	3	30
[ ]	4	4	0
[ ]	5	5	20

Enter the multiplication factor that corresponds to the flow code: 0.00

Flow Code	Multiplication Factor
11, 31, or 41	0 00
12, 32, or 42	0.05
13, 33, or 43	0.10
14 or 34	0.15
21 or 51	0.10
22 or 52	0.30
23 or 53	0.60
24	1.00

HPRI code checked . 3

Base Score (HPRI Score). 30 X (Multiplication Factor) 0 00 = 0

B. Additional Points – NEP Program

For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

	Code	Points
[X]	1	10
[ ]	2	0

C. Additional Points – Great Lakes Area of Concern

For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see instructions)?

	Code	Points
[ ]	1	10
[X]	2	0

Code Number Checked A 3 B 1 C 2

Points Factor 6: A 0 + B 10 + C 0 = **10**

NPDES PERMIT RATING WORK SHEET

SCORE SUMMARY

Factor	Description	Total Points
1	Toxic Pollutant Potential	0
2	Flows / Streamflow Volume	0
3	Conventional Pollutants	0
4	Public Health Impacts	0
5	Water Quality Factors	10
6	Proximity to Near Coastal Waters	10
	TOTAL (Factors 1 through 6)	**20**

S1. Is the total score equal to or grater than 80 ☐ YES; (Facility is a Major) ☒ NO

S2. If the answer to the above questions is no, would you like this facility to be discretionary major?

☒ NO

☐ YES, (Add 500 points to the above score and provide reason below:

Reason. _____

NEW SCORE : 20

OLD SCORE : 40

Permit Reviewer's Name . Susan Mackert

Phone Number. (703 583-3853

Date· March 1, 2016

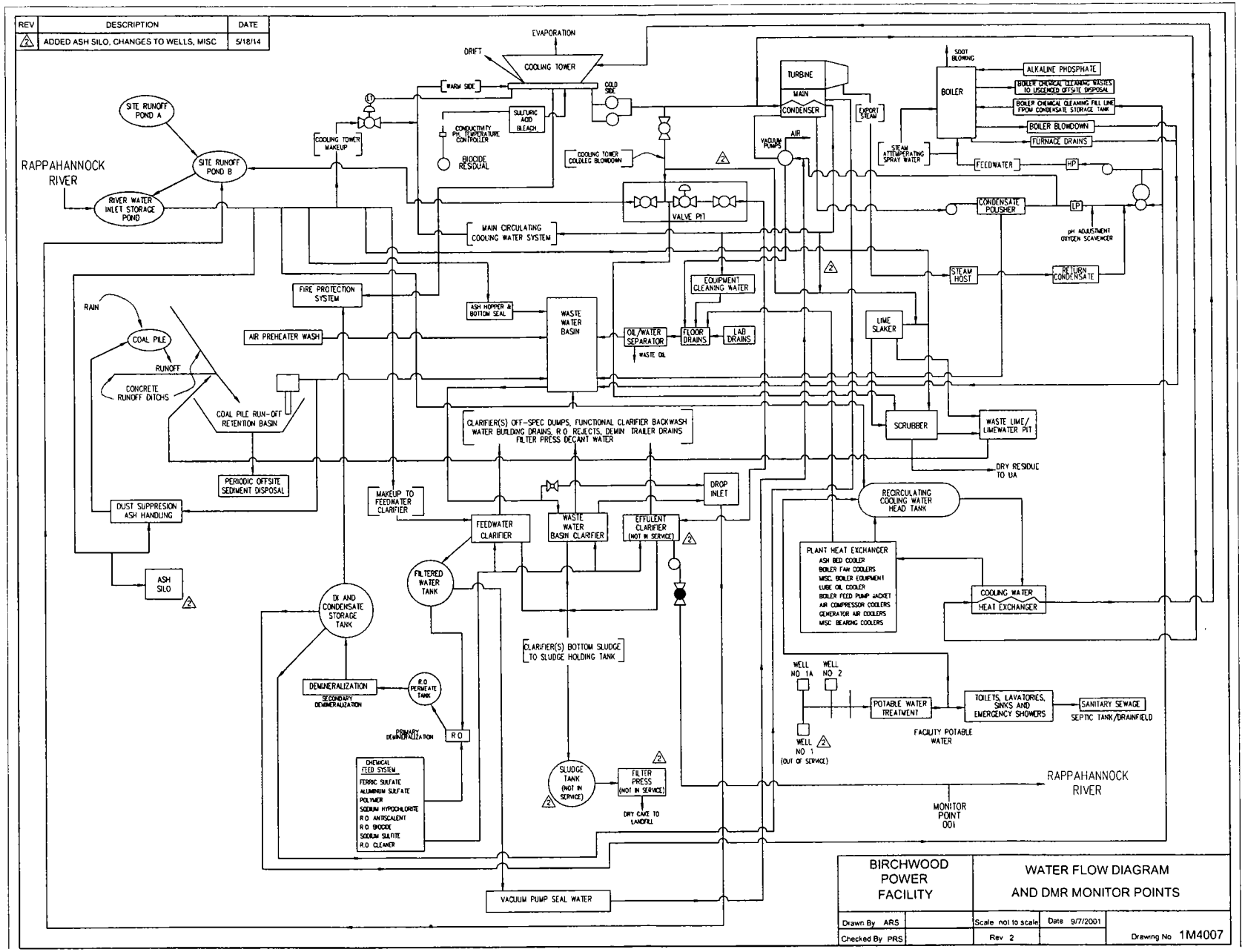

REV
DESCRIPTION
DATE
2
ADDED ASH SILO, CHANGES TO WELLS, MISC
5/18/14
EVAPORATION
DRIFT
COOLING TOWER
WARM SIDE
COLD SIDE
SULFURIC ACID BLEACH
CONDUCTIVITY, PH, TEMPERATURE CONTROLLER
BIOCIDE RESIDUAL
COOLING TOWER MAKEUP
COOLING TOWER COOLING BLOWDOWN
SITE RUNOFF POND A
SITE RUNOFF POND B
RAPPAHANNOCK RIVER
RIVER WATER INLET STORAGE POND
MAIN CIRCULATING COOLING WATER SYSTEM
VALVE PIT
TURBINE
MAIN CONDENSER
VACUUM PUMPS
AIR
EXPORT STEAM
SOOT BLOWING
BOILER
ALKALINE PHOSPHATE
BOILER CHEMICAL CLEANING WASTES TO USE/MED OFFSITE DISPOSAL
BOILER CHEMICAL CLEANING FILL LINE FROM CONDENSATE STORAGE TANK
BOILER BLOWDOWN
FURNACE DRAINS
STEAM ATTEMPERATING SPRAY WATER
FEEDWATER
HP
CONDENSATE POLISHER
LP
pH ADJUSTMENT OXYGEN SCAVENGER
STEAM HOST
RETURN CONDENSATE
EQUIPMENT CLEANING WATER
FIRE PROTECTION SYSTEM
ASH HOPPER & BOTTOM SEAL
WASTE WATER BASIN
OIL/WATER SEPARATOR
WASTE OIL
FLOOR DRAINS
LAB DRAINS
LIME SLAKER
AIR PREHEATER WASH
RAIN
COAL PILE
RUNOFF
CONCRETE RUNOFF DITCHS
COAL PILE RUN-OFF RETENTION BASIN
CLARIFIER(S) OFF-SPEC DUMPS, FUNCTIONAL CLARIFIER BACKWASH WATER BUILDING DRAINS, R.O. REJECTS, DEMIN TRAILER DRAINS FILTER PRESS DECANT WATER
SCRUBBER
WASTE LIME/ LIMEWATER PIT
DRY RESIDUE TO UA
PERIODIC OFFSITE SEDIMENT DISPOSAL
DUST SUPPRESION ASH HANDLING
MAKEUP TO FEEDWATER CLARIFIER
DROP INLET
RECIRCULATING COOLING WATER HEAD TANK
FEEDWATER CLARIFIER
WASTE WATER BASIN CLARIFIER
EFFLUENT CLARIFIER (NOT IN SERVICE)
PLANT HEAT EXCHANGER
ASH BED COOLER
BOILER FAN COOLERS
MISC. BOILER EQUIPMENT
LUBE OIL COOLER
BOILER FEED PUMP JACKET
AIR COMPRESSOR COOLERS
GENERATOR AIR COOLERS
MISC BEARING COOLERS
COOLING WATER HEAT EXCHANGER
ASH SILO
FILTERED WATER TANK
DI AND CONDENSATE STORAGE TANK
CLARIFIER(S) BOTTOM SLUDGE TO SLUDGE HOLDING TANK
WELL NO 1A
WELL NO 2
WELL NO 1 (OUT OF SERVICE)
POTABLE WATER TREATMENT
FACILITY POTABLE WATER
TOILETS, LAVATORIES, SINKS AND EMERGENCY SHOWERS
SANITARY SEWAGE
SEPTIC TANK/DRAINFIELD
DEMINERALIZATION
SECONDARY DEMINERALIZATION
R.O PERMEATE TANK
PRIMARY DEMINERALIZATION
R.O
CHEMICAL FEED SYSTEM
FERRIC SULFATE
ALUMINUM SULFATE
POLYMER
SODIUM HYPOCHLORITE
R.O. ANTISCALENT
R.O. BIOCIDE
SODIUM SULFITE
R.O. CLEANER
SLUDGE TANK (NOT IN SERVICE)
FILTER PRESS (NOT IN SERVICE)
DRY CAKE TO LANDFILL
RAPPAHANNOCK RIVER
MONITOR POINT 001
VACUUM PUMP SEAL WATER
BIRCHWOOD POWER FACILITY
WATER FLOW DIAGRAM AND DMR MONITOR POINTS
Drawn By ARS
Checked By PRS
Scale not to scale
Rev 2
Date 9/7/2001
Drawing No 1M4007

Table 1000.11.01-1 Petroleum Product Containing Equipment Birchwood Power Facility					
Equipment Number	**Equipment Description**	**Capacity (gallons)**	**Material Stored**	**Use**	**Location**
1	Lighter Oil AST	200,000	No. 2 Fuel Oil	Boiler fuel oil storage	South of water/wastewater treatment plant
2	Turbine Oil AST	10,000	Lubricating oil	Turbine oil storage	Northeast corner of boiler building
3	Used Turbine Oil AST	10,000	Used oil	Used turbine oil storage	Lighter oil tank dike
4	Tractor Fuel Station AST	5,000	Diesel oil	Vehicle and train fuel	Northeast of tractor garage
5	Fire Protection Pump Tank	640	Diesel oil	Fire protection pump fuel	Fire protection building basement
6	Emergency Generator Fuel AST	500	Diesel oil	Emergency generator fuel	Northeast corner of boiler building
7	Gasoline Fuel Station AST	500	Gasoline	Equipment fuel	Lighter oil tank dike
8	Portable Fueling AST	100	Diesel	Equipment fuel	South end of tractor garage, empty storage drum area (under covered shed)
9	Used Oil AST	500	Used oil	Used oil storage	Northeast corner of boiler building
10	Used Oil Shed	~ 10 @ 55 each 550 (total)	Various Used oil	Used oil storage	Northeast corner of boiler building
11	Tractor Garage Floor Drain UST	500	Spilled materials	Emergency spill or overfill containment	North end of tractor garage
12	Starting Station Service Transformer	9,595	Type 1 transformer oil	Transformer Cooling	North end of switch yard
13	A Station Service Transformer	3,250	Type 1 transformer oil	Transformer Cooling	Southeast end of switch yard
14	B Station Service Transformer	3,250	Type 1 transformer oil	Transformer Cooling	South end of switch yard
15	Main Power Transformer	15,700	Type 1 transformer oil	Transformer Cooling	Southwest corner of switch yard
16	Cooling Tower Transformer	210	Silicone transformer liquid	Transformer Cooling	Next to Cooling Tower
17	Wastewater Treatment Plant Transformer	152	Silicone transformer liquid	Transformer Cooling	Next to Wastewater Treatment Plant
18	Lube Oil Shed	~19 @ 55 each 1,045 (total)	Lubricating oil	Lubricating oil storage	Lube Oil Storage Shed
19	Oil Drum Storage Areas	~52 @ 55 each 2,860 (total)	Lubricating oil, Used oil	Lubricating oil storage	Inside the south end of boiler building, inside tractor garage bay, used oil may temporarily be stored in used oil dikes
20	Skimmed Oil Drum	55	Used oil	Skimmed oil storage	Next to oil/water separator

Table 1000.11.01-1
Petroleum Product Containing Equipment
Birchwood Power Facility

Equipment Number	Equipment Description	Capacity (gallons)	Material Stored	Use	Location
21	Electro/Hydraulic Controls (EHC) Reservoir	250	Hydraulic oil	Lubricating oil storage	Ground floor of boiler building under turbine
22	Main Turbine Oil Reservoir	10,000	Lubricating oil	Lubricating oil storage	Ground floor of boiler building under turbine
23	Coal Mills A, B, C, D Gearboxes	188 each 752 (total)	Lubricating oil	Lubricating oil storage	Ground floor of boiler building next to pulverizers A, B, C and D
24	Forced Draft and Primary Air Fan Hydraulic Oil Coupling	240 each 480 (total)	Lubricating oil	Lubricating oil storage	Ground floor of boiler building next to FD Fan
25	Induce Draft Fan A and B Hydraulic Oil Coupling	240 each 480 (total)	Hydraulic oil	Lubricating oil storage	On either Side of Stack
26	Boiler Feed Pump A and B Hydraulic Oil Coupling	605 each 1,210 (total)	Hydraulic oil	Lubricating oil storage	Ground floor of boiler building next to Boiler Feed Pumps A and B
27	Air Pre-Heater Support Bearing Gearbox	59	Lubricating oil	Lubricating oil storage	Between 2nd and 3rd floor of boiler building next to Air Heater
28	Coal Unloader Gearboxes	150 each 300 (total)	Lubricating oil	Lubricating oil storage	Next to Coal Unloader
29	Coal Unloader Transformer	361	Type 1 transformer oil	Transformer Cooling	Next to Coal Unloader
30	Coal Crusher Transformer	361	Type 1 transformer oil	Transformer Cooling	Next to Coal Crusher
31	River Water Pump Transformer	114	Silicone transformer liquid	Transformer Cooling	Next to River Water Pumps
32	"A" 480v Bus Transformer	207	Silicone transformer liquid	Transformer Cooling	Switchgear Room
33	"B" 480v Bus Transformer	207	Silicone transformer liquid	Transformer Cooling	Switchgear Room
34	Warming Blanket Transformer	203	Silicone transformer liquid	Transformer Cooling	Turbine Deck
	Approx. Total Capacity	279,391			

Table 1000.11.01-2

Lighter Oil AST Equipment No. 1
Oil Spill Prevention Summary
Birchwood Power Facility

Issue	Compliance
Containment	Secondary - Concrete dike Tertiary – Drainage to Site Runoff Pond B
Dike valves	1. Valves must be of manual open and closed design. 2. Valves must normally be sealed closed. 3. Before releasing rainwater from dike, follow procedures on Section 1000.11.4.4 of the SPCC/ODC Plan Procedure.
Fail-safe Design	Maintain direct-read liquid level gauge and high level alarm.
Truck Loading Area	1. Maintain curbing such that an oil release from truck loading drains into the containment dike. 2. Maintain spill containment kit near tank. 3. Provide vehicle chock blocks. 4. Provide truck loading warning signs.
Oil Inventory Control	Not Applicable
Leak Detection	The Lighter Oil AST is equipped with a 40 mil high density polyethylene liner RPB (see Appendix J). Leak detection for this tank consists of monitoring the interstitial space between the tank bottom and the RPB by sampling the four standpipes, which collect any liquids in the interstitial space. The foundation is constructed such that a leak would flow on top of the RPB to four standpipes. The associated piping is aboveground, leak detection is accomplished by visually monitoring the pipes.
Testing	1. Tank - Nondestructive tank testing every 10 years 2. Piping - Hydrostatic or other approved method testing every 5 years 3. High level alarm and liquid level gauge – follow manufacturer's recommendations.
Inspection	Complete the daily and two weekly inspections using Forms 1, 2 and 3, respectively.
Spill and Leak Response	1. If a leak is discovered, follow the procedures in Section 3000.24.16.3 of the Birchwood Emergency Action Plan procedures and complete as appropriate the Emergency Contact List and Oil or Chemical Spill Report Forms 3000.24.01-3 and 3000.24.01-1 in the Emergency Action Plan. 2. Cleanup leak or spill and begin repairs within 72 hours of discovery 3. After the spill cleanup and repair, follow the Post Discharge Review Procedures in Section 1000.11.4.5.22.

Table 1000.11.01-2

Turbine Lube Oil and Used Oil ASTs Equipment Nos. 2 and 3
Oil Spill Prevention Summary
Birchwood Power Facility

Issue	Compliance
Containment	Secondary – Concrete dike Tertiary – Drainage to Site Runoff Pond B
Dike valves	1. Valves must be of manual open and closed design. 2. Valves must normally be sealed closed. 3. Before releasing rainwater from dike, follow procedures on Section 1000.11.4.4 of the SPCC/ODC Plan Procedure.
Fail-safe Design	Maintain direct-read liquid level gauge and high level alarms.
Truck Loading Area	1. Maintain drainage such that an oil release from truck loading drains into Site Runoff Pond B. 2. Maintain spill containment kit near tanks. 3. Provide vehicle chock blocks. 4. Provide truck loading warning signs.
Oil Inventory Control	Not Applicable
Leak Detection	AST is equipped with an RPB (see Figure 14 and 15). The tank constructed on a tank pedestal. The pedestal is covered with an epoxy coating with grooves cut into the surface to allow drainage of leaked oil into the containment dike, where such a leak would be visually detected. The RPB consists of the epoxy coating that meets the criteria described on page 10 of the Virginia AST Leak Detection Guidelines (revised February 1994). Associated piping is aboveground except for a 30-ft. section that runs under the railroad tracks. This section is double-walled high-density polyethylene pipe. Piping leak detection consists of monitoring the interstitial space between the two pipes. At the low point of the piping system, a leak detection port is provided.
Testing	1. Tank – Nondestructive tank testing every 10 years 2. Piping – Hydrostatic or other approved method testing every 5 years 3. Liquid level gauges – follow manufacturer's recommendations.
Inspection	Follow daily and weekly inspection checklists using Forms 1, 2 and 3.
Spill and Leak Response	1.If a leak is discovered, follow the procedures in Section 3000.24.16.3 of the Birchwood Emergency Action Plan procedures and complete as appropriate the Emergency Contact List and Oil or Chemical Spill Report Forms 3000.24.01-3 and 3000.24.01-1 in the Emergency Action Plan. 2. Cleanup leak or spill and begin repairs within 72 hours of discovery 3. After the spill cleanup and repair, follow the Post Discharge Review Procedures in Section 1000.11.4.5.22.

Table 1000.11.01-2

Tractor Fuel Station AST Equipment No. 4
Oil Spill Prevention Summary
Birchwood Power Facility

Issue	Compliance
Containment	Secondary - Metal tank dike Tertiary – Drainage to Site Runoff Pond B
Dike valves	1. Valves must be of manual open and closed design. 2. Valves must normally be sealed closed. 3. Before releasing rainwater from dike, follow procedures on Section 1000.11.4.4 of the SPCC/ODC Plan Procedure.
Fail-safe Design	Manually stick gauge tank prior to fuel loading.
Truck Loading Area	1. Oil release from truck loading drains to runoff system into Site Runoff Pond B. 2. Maintain spill containment kit at garage. 3. Provide vehicle chock blocks. 4. Provide truck loading warning signs.
Oil Inventory Control	Not Applicable
Leak Detection	AST is a dike tank, i.e., a cylindrical tank constructed inside a rectangular tank. The tank dike is provided with a leak detection sump, leak detection is accomplished by sliding back the rain shields and visually observing the sump for the presence of oil. There is relatively little piping associated with this tank. The transfer piping runs from the tank to a dispensing pump located just outside the secondary containment tank. The piping is all above ground, therefore, leak detection determined by visual observation.
Testing	1. Tank – Nondestructive tank testing every 10 years 2. Piping – Hydrostatic testing not practical
Inspection	Complete the daily and weekly inspections using Forms 1 and 2, respectively.
Spill and Leak Response	1. If a leak is discovered, follow the procedures in Section 3000.24.16.3 of the Birchwood Emergency Action Plan procedures and complete as appropriate the Emergency Contact List and Oil or Chemical Spill Report Forms 3000.24.01-3 and 3000.24.01-1 in the Emergency Action Plan. 2. Cleanup leak or spill and begin repairs within 72 hours of discovery 3. After the spill cleanup and repair, follow the Post Discharge Review Procedures in Section 1000.11.4.5.22.

Table 1000.11.01-2

Fire Protection Pump AST Equipment No. 5
Oil Spill Prevention Summary
Birchwood Power Facility

Issue	Compliance
Containment	Secondary - Metal dike located inside building
Dike valves	Not applicable
Fail-safe Design	Maintain direct-read liquid level gauge and high level alarm.
Truck Loading Area	1. Release would drain into storm water system into Site Runoff Pond B. 2. Maintain spill containment kit at Lighter Oil Tank.
Oil Inventory Control	Not Applicable
Leak Detection	Maintain the secondary dike tank and inspect the dike tank for oil leakage and piping for oil leakage as part of the daily and weekly inspections
Testing	Tank - testing not practical Piping – testing of short run, small diameter above ground piping not practical
Inspection	Complete the daily and weekly inspections using Forms 1 and 2, respectively.
Spill and Leak Response	1. If a leak is discovered, follow the procedures in Section 3000.24.16.3 of the Birchwood Emergency Action Plan procedures and complete as appropriate the Emergency Contact List and Oil or Chemical Spill Report Forms 3000.24.01-3 and 3000.24.01-1 in the Emergency Action Plan. 2. Cleanup leak or spill and begin repairs within 72 hours of discovery 3. After the spill cleanup and repair, follow the Post Discharge Review Procedures in Section 1000.11.4.5.22.

Table 1000.11.01-2

Emergency Generator AST Equipment No. 6
Oil Spill Prevention Summary
Birchwood Power Facility

Issue	Compliance
Containment	Secondary – Fiberglass berm Tertiary - Drainage to Site Runoff Pond B
Dike valves	None
Fail-safe Design	Tank equipped with fuel gage
Truck Loading Area	1. Maintain drainage such that an oil release from truck loading drains into Site Runoff pond B. 2. Maintain spill containment kit located in Lube Oil Shed. 3. Provide vehicle chock blocks (chocks located by the used oil tank).
Oil Inventory Control	Not Applicable
Leak Detection	Inspect the generator concrete pad for oil leakage as part of the daily and weekly inspections.
Testing	None
Inspection	Complete the daily and weekly inspections using Forms 1 and 2, respectively.
Spill and Leak Response	1. If a leak is discovered, follow the procedures in Section 3000.24.16.3 of the Birchwood Emergency Action Plan procedures and complete as appropriate the Emergency Contact List and Oil or Chemical Spill Report Forms 3000.24.01-3 and 3000.24.01-1 in the Emergency Action Plan. 2. Cleanup leak or spill and begin repairs within 72 hours of discovery 3. After the spill cleanup and repair, follow the Post Discharge Review Procedures in Section 1000.11.4.5.22.

Table 1000.11.01-2

Gasoline and Portable Fueling ASTs Equipment No. 7 and 8
Oil Spill Prevention Summary
Birchwood Power Facility

Issue	Compliance
Containment	Secondary – Concrete dike (both tanks located in Lighter Oil AST dike) Tertiary – Drainage to Site Runoff Pond B
Dike valves	1. Valves must be of manual open and closed design. 2. Valves must normally be sealed closed. 3. Before releasing rainwater from dike, follow procedures on Section 1000.11.4.4 of the SPCC/ODC Plan Procedure.
Fail-safe Design	Check level prior to filling.
Truck Loading Area	1. Maintain curbing such that an oil release from truck loading drains into the containment dike. 2. Maintain spill containment kit at Lighter Oil Tank. 3. Provide vehicle chock blocks. 4. Provide truck loading warning signs.
Oil Inventory Control	Not Applicable
Leak Detection	Tanks including tank bottoms situated above ground. Inspect the dike floor for oil leakage as part of the daily and weekly inspections.
Testing	Tank and pipe testing not practical
Inspection	Complete the daily and weekly inspections using Forms 1 and 2, respectively.
Spill and Leak Response	1. If a leak is discovered, follow the procedures in in Section 3000.24.16.3 of the Birchwood Emergency Action Plan procedures and complete as appropriate the Emergency Contact List and Oil or Chemical Spill Report Forms 3000.24.01-3 and 3000.24.01-1 in the Emergency Action Plan. 2. Cleanup leak or spill and begin repairs within 72 hours of discovery 3. After the spill cleanup and repair, follow the Post Discharge Review Procedures in Section 1000.11.4.5.22.

Table 1000.11.01-2

Lube Oil Shed and Tractor Garage Used Oil ASTs Equipment No. 9 and 10
Oil Spill Prevention Summary
Birchwood Power Facility

Issue	Compliance
Containment	Tank No. 9 Secondary – secondary steel tank wall Tertiary – Concrete dike Tank No. 10 Secondary – Concrete dike Tertiary – Drainage to Site Runoff Pond B
Dike valves	1. Valves must be of manual open and closed design. 2. Valves must normally be sealed closed. 3. Before releasing rainwater from dike, follow procedures on Section 1000.11.4.4 of the SPCC/ODC Plan Procedure.
Fail-safe Design	Check tank level prior to placing used oil in tank.
Truck Loading Area	1. Maintain drainage such that an oil release from truck unloading drains into Site Runoff Pond B. 2. Maintain spill containment kit near tanks (i.e. kits located in Lube Oil Shed and Tractor Garage) . 3. Provide vehicle chock blocks (at Lube Oil Shed only). 4. Provide truck loading warning signs. (at Turbine Lube Oil AST only).
Oil Inventory Control	Not Applicable
Leak Detection	Tanks including bottoms situated above dike floor. Inspect the containment dike for oil leakage as part of the daily and weekly inspections.
Testing	Tank and pipe testing not practical
Inspection	Complete the daily and weekly inspections using Forms 1 and 2, respectively.
Spill and Leak Response	1. If a leak is discovered, follow the procedures in Section 3000.24.16.3 of the Birchwood Emergency Action Plan procedures and complete as appropriate the Emergency Contact List and Oil or Chemical Spill Report Forms 3000.24.01-3 and 3000.24.01-1 in the Emergency Action Plan. 2. Cleanup leak or spill and begin repairs within 72 hours of discovery 3. After the spill cleanup and repair, follow the Post Discharge Review Procedures in Section 1000.11.4.5.22.

Table 1000.11.01-2 Tractor Garage Floor Drain UST Equipment No. 11 Oil Spill Prevention Summary Birchwood Power Facility	
Issue	**Compliance**
Containment	Secondary –Double walled tank
Dike valves	Not applicable
Fail-safe Design	Floor drains that drain into UST are capped except in the event of a release in Tractor Garage.
Truck Loading Area	A release from unloading the tank would drain into stormwater system into the site Runoff Pond B
Oil Inventory Control	NA
Leak Detection	Leak detection port to interstitial space
Testing	Tank and pipe testing not practical
Inspection	NA
Spill and Leak Response	If spill or overfill occurs in the tractor garage, if necessary floor drains would be uncapped and allow spilled material to flow to the UST. Once the spill is controlled and contained, empty the UST as expeditiously as possible

Table 1000.11.01-2

Starting Station, A and B Station Service, Main Power, Cooling Tower and Wastewater Treatment Plant Transformers Equipment Nos. 12, 13, 14, 15, 16, 17, 29, 30, 31
Oil Spill Prevention Summary
Birchwood Power Facility

Issue	Compliance
Containment	Secondary – Concrete dike Tertiary – Drainage to Site Runoff Pond B
Dike valves	1. Valves must be of manual open and closed design. 2. Valves must normally be sealed closed. 3. Before releasing rainwater from dike, follow procedures on Section 1000.11.4.4 of the SPCC/ODC Plan Procedure.
Fail-safe Design	Not Applicable
Truck Loading Area	Not Applicable
Oil Inventory Control	Not Applicable
Leak Detection	Not Applicable
Testing	Not Applicable
Inspection	Follow daily and weekly inspection checklists using Forms 1, 2 and 3.
Spill and Leak Response	1. If a leak is discovered, follow the procedures in Section 3000.24.16.3 of the Birchwood Emergency Action Plan procedures and complete as appropriate the Notification Document and Spill Report Forms 5 and 6. 2. Cleanup leak or spill and begin repairs within 72 hours of discovery 3. After the spill cleanup and repair, follow the Post Discharge Review Procedures in Section 1000.11.4.5.22.

Table 1000.11.01-2

Oil Drum Storage Area, Lube Oil Shed, Used Oil Collection Drums and Oil Skimmer Drum
Equipment Nos. 18, 19, and 20
Oil Spill Prevention Summary
Birchwood Power Facility

Issue	Compliance
Containment	Oil Skimmer Drum, Used Oil Collection Drums Secondary – Concrete dike or Plastic Containment Skid Tertiary – Drainage to Site Runoff Pond B Lube Oil Shed Secondary – Floor sloped to drain into oil collection sump Tertiary – Drainage to Site Runoff Pond B Oil Drum Storage Area Secondary – Containment skids Tertiary – Drainage to floor drains that flow to Oil/Water Separator
Dike valves	Concrete Dike and Collection Sump 1. Valves must be of manual open and closed design. 2. Valves must normally be sealed closed. 3. Before releasing rainwater from dike, follow procedures on Section 1000.11.4.4 of the SPCC/ODC Plan Procedure.
Fail-safe Design	Not Applicable
Truck Loading Area	Not Applicable
Oil Inventory Control	Not Applicable
Leak Detection	Not Applicable
Testing	Not Applicable
Inspection	Follow daily and weekly inspection checklists using Forms 1, 2 and 3.
Spill and Leak Response	3. If a leak is discovered, follow the procedures in Section 3000.24.16.3 of the Birchwood Emergency Action Plan procedures and complete as appropriate the Notification Document and Spill Report Forms 5 and 6. 4. Cleanup leak or spill and begin repairs within 72 hours of discovery 3. After the spill cleanup and repair, follow the Post Discharge Review Procedures in Section 1000.11.4.5.22.

Table 1000.11.01-2

EHC and Main Turbine Oil Reservoir; Coal Mill A – D, Air Heater and Coal Unloader Gearboxes; FD and Primary Air Fans, ID Fans and Boiler Feed Pump Hydraulic Couplings Equipment Nos. 21, 22, 23, 24, 25, 26, 27 and 28
Oil Spill Prevention Summary
Birchwood Power Facility

Issue	Compliance
Containment	All equipment except Coal Unloading Gearbox and ID Fans Secondary – Drainage to floor drains that flow to Oil/Water Separator Tertiary – Drainage to Site Runoff Pond B Coal Unloading Gearbox Secondary – Drainage to Coal Unloader Vault ID Fans Hydraulic Couplings Secondary – Concrete curbing around slab with drain valve Tertiary - Drainage to Site Runoff Pond B
Dike valves	FD Fans Concrete Curbing 1. Valves must be of manual open and closed design. 2. Valves must normally be sealed closed. 3. Before releasing rainwater from dike, follow procedures on Section 1000.11.4.4 of the SPCC/ODC Plan Procedure.
Fail-safe Design	Not Applicable
Truck Loading Area	Not Applicable
Oil Inventory Control	Not Applicable
Leak Detection	Not Applicable
Testing	Not Applicable
Inspection	Follow daily and weekly inspection checklists using Forms 1, 2 and 3.
Spill and Leak Response	1. If a leak is discovered, follow the procedures in Section 3000.24.16.3 of the Birchwood Emergency Action Plan procedures and complete as appropriate the Notification Document and Spill Report Forms 5 and 6. 2. Cleanup leak or spill and begin repairs within 72 hours of discovery 3. After the spill cleanup and repair, follow the Post Discharge Review Procedures in Section 1000.11.4.5.22.

Table 1000.11.01-2

"A" and B 480 Bus, and Blanket Warming Transformers Equipment Nos. 32, 33, and 34
Oil Spill Prevention Summary
Birchwood Power Facility

Issue	Compliance
Containment	Secondary – Drainage to Boiler Building Floor Drains
Dike valves	Not Applicable
Fail-safe Design	Not Applicable
Truck Loading Area	Not Applicable
Oil Inventory Control	Not Applicable
Leak Detection	Not Applicable
Testing	Not Applicable
Inspection	Follow weekly inspection checklists using Form 2.
Spill and Leak Response	5. If a leak is discovered, follow the procedures in Section 3000.24.16.3 of the Birchwood Emergency Action Plan procedures and complete as appropriate the Notification Document and Spill Report Forms 5 and 6. 6. Cleanup leak or spill and begin repairs within 72 hours of discovery 3. After the spill cleanup and repair, follow the Post Discharge Review Procedures in Section 1000.11.4.5.22.

Table 1000.11.01-2

Facility-Wide Requirements Compliance Summary
Birchwood Power Facility

Issue	Compliance
Reporting	1. Submit SPCC Plan to EPA Region III in the event of an oil spill equal to or greater than 1,000 gallon or two events of any size in 1 year. 2. Report any spill event equal to or greater than 25 gallon to persons and agencies listed in the Notification Documentation Form (Form 5).
Recordkeeping	1. Maintain copy of SPCC/ODC Plans onsite at all times 2. Maintain oil throughput data records for 3 years. 3. Maintain records of all Facility Inspection Checklists for 3 years (Forms 1, 2 and 3) 4. Maintain records of tank and piping testing for 3 years. 5. Maintain records of attendance and topics discussed at Spill Prevention Training programs. 6. Maintain records of oil spill and leakage events including Spill Report and Notification Documentation Forms (Forms 5 and 6). 7. Maintain Records of Dike Drainage Forms (Form 4).
Plan Modification	1. The ODC Plan must be reviewed, updated if necessary and resubmitted to DEQ for approval every 60 months. 2. If significant changes occur prior to the 60-month period, modify the plan and submit the plan within 30 days of the occurrence. Significant changes include: ▪ Change in owner. ▪ Substantial increase in maximum storage or handling capacity. ▪ Decrease in personnel or equipment available to control a spill event. ▪ Change in oil products stored. 3. The SPCC Plan must be reviewed every 5 years and amend the SPCC plan within six months of the review. 4. The SPCC Plan must be amended sooner if there is a change in the facilities design, construction or operation, which affects the facility's potential for discharge of oil.
Drainage	Maintain drainage such at oil spilled outside the containment dikes flow or can be pumped into the site runoff ponds.
Auxiliary Pumps	Maintain portable pumps to serve as auxiliary oil/water separator and to pump oil-water mixture from containment dikes to oil/water separator.
Effluent Discharge	Monitor discharge to Rappahannock River according to VPDES Permit.
Out-of-Service Piping	Pipelines out of services greater than six months must be capped and marked as to their origin.
Vehicle Safety	Provide bollards to protect tanks and piping.
Training	1. Provide Oil Spill Preventing Training to appropriate new employees within one week of starting employment. 2. Provide Oil Spill Prevention Training Briefings to all employees initially then every three years. 3. Periodically conduct unannounced simulation of an onsite oil spill.
Spill and Leak Response	1. If a leak is discovered, follow the procedures in Section 3000.24.16.3 of the Birchwood Emergency Action Plan procedures and complete as appropriate the Emergency Contact List and Oil or Chemical Spill Report Forms 3000.24.01-3 and 3000.24.01-1 in the Emergency Action Plan. 2. Cleanup leak or spill and begin repairs within 72 hours of discovery 3. After the spill cleanup and repair, follow the Post Discharge Review Procedures in Section 1000.11.4.5.22 of the SPCC/ODC Plan.

MEMORANDUM

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHERN REGIONAL OFFICE

13901 Crown Court Woodbridge, VA 22193

SUBJECT: Birchwood Power Facility Reissuance Site Visit

TO: Permit Reissuance File (VA0087645)

FROM: Susan Mackert

DATE: March 3, 2016

In support of the reissuance of the above referenced Virginia Pollutant Discharge Elimination System (VPDES) permit, a site visit was performed on February 4, 2016. The following are noted.

General Site Observations

- The Birchwood Power Facility is an existing coal fired power station which became operational in 1996. The facility consists of one coal fired boiler and one General Electric DS steam turbine which generates 240 MW.
- Water needed for facility operations is withdrawn from the Rappahannock River under a Virginia Water Protection (VWP) surface water withdrawal permit (91-1692). The intake structure consists of two twenty-four inch diameter pipes which can each withdraw the maximum amount of water required. Only one intake operates at any given time. The design intake velocity is 0.25 feet per second with a mesh screen size of one millimeter to prevent impingement and entrainment. The water that is withdrawn is then stored in a 12 million gallon lined pond known as the inlet storage pond (photos 1 - 3).
- In addition to the inlet storage pond, the facility has three other ponds located on site: the coal pile runoff pond (photo 1), stormwater runoff pond "A" (photos 4 - 5), and stormwater runoff pond "B" (photos 6 – 8).
- The facility receives coal via rail and has onsite storage of approximately 20 – 30 days. Coal is stored within a designated area (photo 9). The coal storage area is sloped so that stormwater runoff is directed to the coal pile runoff pond by a concrete drainage ditch (photos 10 - 12) located adjacent to the storage area. In the event of a failure, the coal pile runoff pond would spill over in to Pond B (photos 6 – 8).
- Stormwater runoff pond "A" (photos 4 – 5) is located outside of the industrial area and collects stormwater from the northwestern side of the facility. The drainage to this stormwater ponds includes yard drains and ditches along the roadway.
- Stormwater runoff pond "B" (photos 6 – 8) is located within the industrial area and collects stormwater from approximately 26 acres. The drainage to this stormwater pond includes the site's storm drain system.
- Due to the nature of the facility's ash handling process, there are no coal ash ponds on site. Bottom ash is temporarily stored within the coal storage area (photo 13) and fly ash is temporarily stored within an ash silo (photo 14) prior to being transported by truck to the King George Landfill.
- Water management practices implemented by the facility have resulted in there being no discharge from the facility since January 2006. All wastewater generated by the facility is collected and recycled as process makeup water. Additionally, all stormwater is captured and eventually used as process water. Should the facility need to discharge, a discharge to the Rappahannock River is authorized via Outfall 001 (photo 15).

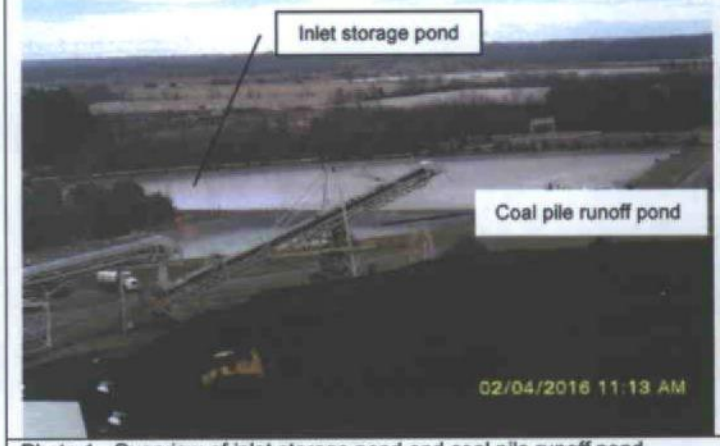


Photo 1. Overview of inlet storage pond and coal pile runoff pond.

Photo 2. Combined with photo 3 shows inlet storage pond. The discharge shown into the pond is from Pond B.

Photo 3. Combined with photo 2 shows the inlet storage pond.

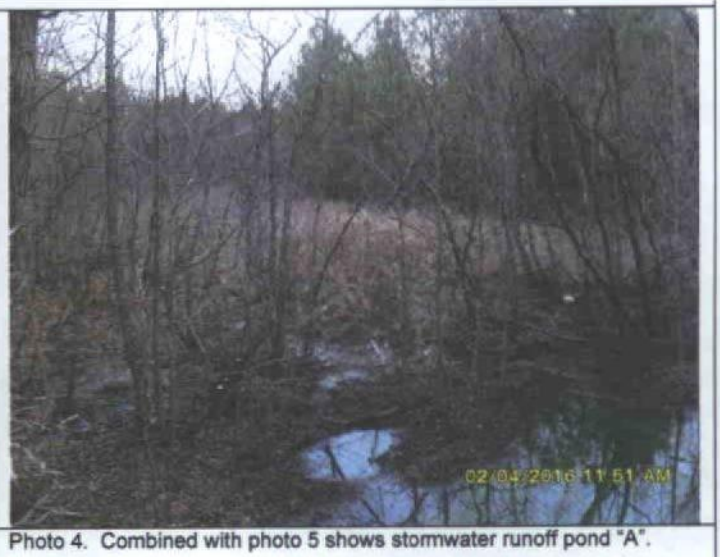


Photo 4. Combined with photo 5 shows stormwater runoff pond "A".

Photo 5. Combined with photo 6 shows stormwater runoff pond "A".

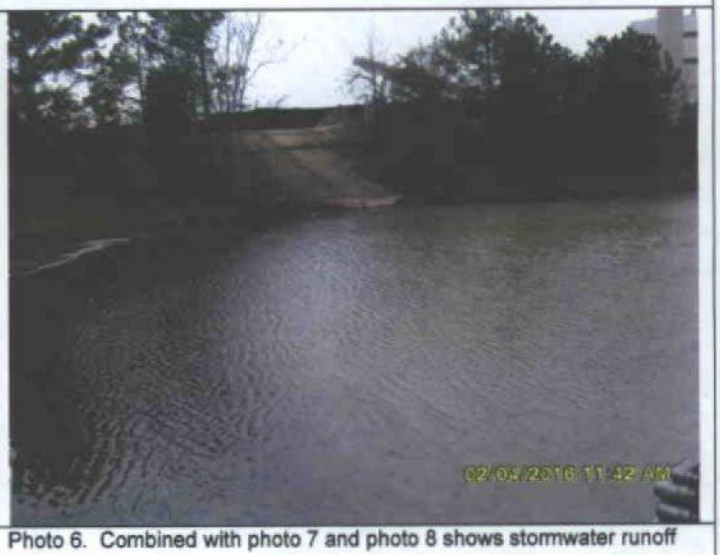


Photo 6. Combined with photo 7 and photo 8 shows stormwater runoff pond "B".

Photo 7. Combined with photo 6 and photo 8 shows stormwater runoff pond "B".

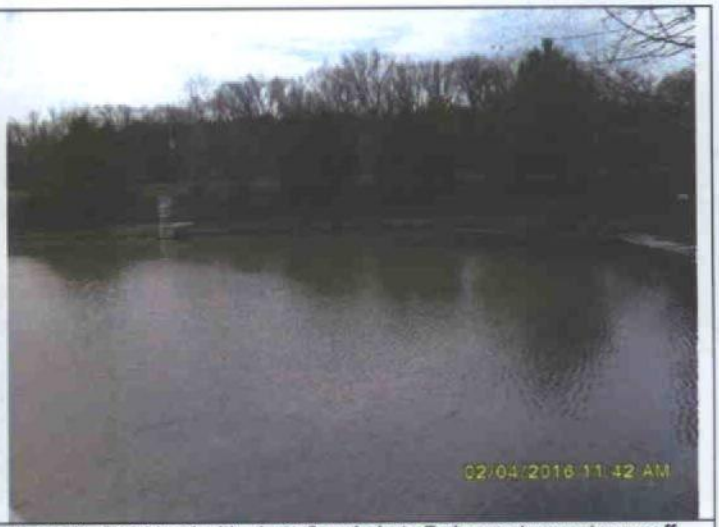


Photo 8. Combined with photo 6 and photo 7 shows stormwater runoff pond "B".

Photo 9. Coal storage area.

Photo 10. Concrete drainage ditch adjacent to coal storage area. Stormwater flow is in the direction of the arrow.

Photo 11. Concrete drainage ditch adjacent to coal storage area. Stormwater flow is in the direction of the arrow.

Photo 12. The concrete drainage ditches shown in photo 10 and photo 11 combine at this location and discharge to the coal pile runoff pond. Stormwater flow is in the direction of the arrow.

Photo 13. Temporary bottom ash storage located within coal storage area.

Photo 14. Fly ash storage silo.

Photo 15. Discharge pipe to Rappahannock River.

Mackert, Susan (DEQ)

From: Shoemaker, Rebecca (DEQ)
Sent: Wednesday, July 23, 2014 7:26 AM
To: Mackert, Susan (DEQ)
Cc: Carlson, Jennifer (DEQ); Thomas, Bryant (DEQ)
Subject: Birchwood Power planning statement
Attachments: Birchwood Power VA0087645 Permit Planning Statement.docx

Susan

Attached is the planning statement for Birchwood.

Rebecca Shoemaker
TMDL Coordinator
Virginia Department of Environmental Quality
Northern Regional Office
13901 Crown Court, Woodbridge, VA 22193
Telephone: 703-583-3807

TMDLs in Virginia

To:	Susan Mackert
From:	Rebecca Shoemaker
Date:	July 22, 2014
Subject:	Planning Statement for Birchwood Power Facility
Permit Number:	VA0087645

Information for Outfall 001:

Discharge Type:	Industrial
Discharge Flow:	No Discharge
Receiving Stream:	Rappahannock River
Latitude / Longitude:	38°14'34.2"N/77°17'36.5"W (Outfall 001)

Rivermile: 97
Streamcode: 3-RPP
Waterbody: VAN-E21E
Water Quality Standards: Class II, Section 1, special stds. a.
Drainage Area: 1,720 square miles

1. Please provide water quality monitoring information for the receiving stream segment. If there is not monitoring information for the receiving stream segment, please provide information on the nearest downstream monitoring station, including how far downstream the monitoring station is from the outfall.

   This facility is located on the Rappahannock River. DEQ Chesapeake Bay/ambient station 3-RPP098.81 is located at Buoy 112, approximately 2.8 miles upstream from Outfall 001. DEQ fish tissue/sediment station 3-RPP080.19 is located at Route 301, approximately 22 miles downstream from Outfall 001.

   The following is the water quality summary for this segment of the Rappahannock River, as taken from the 2012 Integrated Report:

   Class II, Section 1, special stds. a.

   DEQ monitoring stations located in this segment of the Rappahannock River:
   - *DEQ Chesapeake Bay/ambient station 3-RPP098.81, at Buoy 112.*

   The fish consumption use was assessed using DEQ fish tissue/sediment station 3-RPP080.19 (located in a downstream segment)and is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory and sufficient excursions above the fish tissue value (TV) for PCBs in fish tissue. Additionally, excursions above the risk-based tissue value (TV) of 300 parts per billion (ppb) for mercury (Hg) in fish tissue was recorded in one species of fish (1 total samples) collected in 2006 at monitoring station 3-RPP080.19 (channel catfish), noted by an observed effect.

   E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. A bacteria TMDL for this portion of the Rappahannock River was approved by EPA on 05/05/2008.

The aquatic life is considered fully supporting. A TMDL has been completed for the Chesapeake Bay watershed. This downstream TMDL completed by EPA addresses the poor water quality in the Chesapeake Bay, and takes into account the entire Bay watershed including upstream tidal tributaries such as the Rappahannock River.

The wildlife use is considered fully supporting. The shellfishing use was not assessed.

2. Does this facility discharge to a stream segment on the 303(d) list? If yes, please fill out Table A.

Table A. 303(d) Impairment and TMDL information for the receiving stream segment

Waterbody Name	Impaired Use	Cause	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in the 2012 Integrated Report						
Rappahannock River	Recreation	*E. coli*	Rappahannock River Bacteria 05/05/2008	None (not expected to discharge pollutant)	---	---
	Fish Consumption	PCBs	---	---	---	2016

3. Are there any downstream 303(d) listed impairments that are relevant to this discharge? If yes, please fill out Table B.

No.

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

There is a completed downstream TMDL for the aquatic life use impairment for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

The tidal Rappahannock River, on which Outfall 001 is located, is listed with a PCB impairment. In support for the PCB TMDL that is scheduled for development by 2016 for the tidal Rappahannock River, this facility is a candidate for low-level PCB monitoring, based upon its designation as a minor industrial discharger. If this facility does discharge, DEQ staff recommends that this facility perform low-level PCB monitoring during the upcoming permit cycle. It is recommended that this facility collect 2 samples using EPA Method 1668, which is capable of detecting low-level concentrations for all 209 PCB congeners. PCB data generated using Method 1668 revisions A, B, C are acceptable, however data generated using versions A or C is preferred.

5. Fact Sheet Requirements – Please provide information regarding any drinking water intakes located within a 5 mile radius of the discharge point.

There are no public water supply intakes located within five miles of this facility.

Dissolved Oxygen Criteria (9VAC25-260-185)

Designated Use	Criteria Concentration/Duration	Temporal Application
Migratory fish spawning and nursery	7-day mean > 6 mg/L (tidal habitats with 0-0.5 ppt salinity)	February 1 – May 31
	Instantaneous minimum > 5 mg/L	
Open-water[1,2]	30-day mean > 5.5 mg/L (tidal habitats with 0-0.5 ppt salinity) 30-day mean > 5 mg/L (tidal habitats with >0.5 ppt salinity)	Year-round
	7-day mean > 4 mg/L	
	Instantaneous minimum > 3.2 mg/L at temperatures < 29°C Instantaneous minimum > 4.3 mg/L at temperatures > 29°C	
Deep-water	30-day mean >3 mg/L	June 1-September 30
	1-day mean > 2.3 mg/L	
	Instantaneous minimum > 1.7 mg/L	
Deep-channel	Instantaneous minimum > 1 mg/L	June 1-September 30

[1]See subsection aa of 9VAC25-260-310 for site specific seasonal open-water dissolved oxygen criteria applicable to the tidal Mattaponi and Pamunkey Rivers and their tidal tributaries.

[2]In applying this open-water instantaneous criterion to the Chesapeake Bay and its tidal tributaries where the existing water quality for dissolved oxygen exceeds an instantaneous minimum of 3.2 mg/L, that higher water quality for dissolved oxygen shall be provided antidegradation protection in accordance with section 30 subsection A.2 of the Water Quality Standards.

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Birchwood Power Facility Permit No.: VA0087645

Receiving Stream: Rappahannock River - Acute Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	mg/L
90% Temperature (Annual) =	deg C
90% Temperature (Wet season) =	deg C
90% Maximum pH =	SU
10% Maximum pH =	SU
Tier Designation (1 or 2) =	1
Public Water Supply (PWS) Y/N? =	n
Trout Present Y/N? =	n
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	4.43 MGD
7Q10 (Annual) =	4.43 MGD
30Q10 (Annual) =	4.43 MGD
1Q10 (Wet season) =	4.43 MGD
30Q10 (Wet season)	4.43 MGD
30Q5 =	4.43 MGD
Harmonic Mean =	4.43 MGD

Mixing Information

Annual - 1Q10 Mix =	0 %
- 7Q10 Mix =	0 %
- 30Q10 Mix =	0 %
Wet Season - 1Q10 Mix =	0 %
- 30Q10 Mix =	0 %

Effluent Information

Mean Hardness (as CaCO3) =	50 mg/L
90% Temp (Annual) =	25 deg C
90% Temp (Wet season) =	deg C
90% Maximum pH =	8 SU
10% Maximum pH =	SU
Discharge Flow =	1 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	na	9 9E+02	--	--	na	5 4E+03	--	--	--	--	--	--	--	--	--	--	na	5.4E+03
Acrolein	0	--	--	na	9 3E+00	--	--	na	5 0E+01	--	--	--	--	--	--	--	--	--	--	na	5.0E+01
Acrylonitrile [C]	0	--	--	na	2 5E+00	--	--	na	1 4E+01	--	--	--	--	--	--	--	--	--	--	na	1.4E+01
Aldrin [C]	0	3 0E+00	--	na	5 0E-04	3 0E+00	--	na	2 7E-03	--	--	--	--	--	--	--	--	3.0E+00	--	na	2.7E-03
Ammonia-N (mg/l) (Yearly)	0	8 41E+00	1 24E+00	na	--	8 41E+00	1 24E+00	na	--	--	--	--	--	--	--	--	--	8.41E+00	1.24E+00	na	--
Ammonia-N (mg/l) (High Flow)	0	8 41E+00	2 43E+00	na	--	8 41E+00	2 43E+00	na	--	--	--	--	--	--	--	--	--	8.41E+00	2.43E+00	na	--
Anthracene	0	--	--	na	4 0E+04	--	--	na	2 2E+05	--	--	--	--	--	--	--	--	--	--	na	2.2E+05
Antimony	0	--	--	na	6 4E+02	--	--	na	3 5E+03	--	--	--	--	--	--	--	--	--	--	na	3.5E+03
Arsenic	0	3 4E+02	1 5E+02	na	--	3 4E+02	1 5E+02	na	--	--	--	--	--	--	--	--	--	3.4E+02	1.5E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene [C]	0	--	--	na	5 1E+02	--	--	na	2 8E+03	--	--	--	--	--	--	--	--	--	--	na	2.8E+03
Benzidine [C]	0	--	--	na	2 0E-03	--	--	na	1 1E-02	--	--	--	--	--	--	--	--	--	--	na	1.1E-02
Benzo (a) anthracene [C]	0	--	--	na	1 8E-01	--	--	na	9 8E-01	--	--	--	--	--	--	--	--	--	--	na	9.8E-01
Benzo (b) fluoranthene [C]	0	--	--	na	1 8E-01	--	--	na	9 8E-01	--	--	--	--	--	--	--	--	--	--	na	9.8E-01
Benzo (k) fluoranthene [C]	0	--	--	na	1 8E-01	--	--	na	9 8E-01	--	--	--	--	--	--	--	--	--	--	na	9.8E-01
Benzo (a) pyrene [C]	0	--	--	na	1 8E-01	--	--	na	9 8E-01	--	--	--	--	--	--	--	--	--	--	na	9.8E-01
Bis2-Chloroethyl Ether [C]	0	--	--	na	5 3E+00	--	--	na	2 9E+01	--	--	--	--	--	--	--	--	--	--	na	2.9E+01
Bis2-Chloroisopropyl Ether	0	--	--	na	6 5E+04	--	--	na	3 5E+05	--	--	--	--	--	--	--	--	--	--	na	3.5E+05
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2 2E+01	--	--	na	1 2E+02	--	--	--	--	--	--	--	--	--	--	na	1.2E+02
Bromoform [C]	0	--	--	na	1 4E+03	--	--	na	7 6E+03	--	--	--	--	--	--	--	--	--	--	na	7.6E+03
Butylbenzylphthalate	0	--	--	na	1 9E+03	--	--	na	1 0E+04	--	--	--	--	--	--	--	--	--	--	na	1.0E+04
Cadmium	0	1 8E+00	6 6E-01	na	--	1 8E+00	6 6E-01	na	--	--	--	--	--	--	--	--	--	1.8E+00	6.6E-01	na	--
Carbon Tetrachloride [C]	0	--	--	na	1 6E+01	--	--	na	8 7E+01	--	--	--	--	--	--	--	--	--	--	na	8.7E+01
Chlordane [C]	0	2 4E+00	4 3E-03	na	8 1E-03	2 4E+00	4 3E-03	na	4 4E-02	--	--	--	--	--	--	--	--	2.4E+00	4.3E-03	na	4.4E-02
Chloride	0	8 6E+05	2 3E+05	na	--	8 6E+05	2 3E+05	na	--	--	--	--	--	--	--	--	--	8.6E+05	2.3E+05	na	--
TRC	0	1 9E+01	1 1E+01	na	--	1 9E+01	1 1E+01	na	--	--	--	--	--	--	--	--	--	1.9E+01	1.1E+01	na	--
Chlorobenzene	0	--	--	na	1 6E+03	--	--	na	8 7E+03	--	--	--	--	--	--	--	--	--	--	na	8.7E+03

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorodibromomethane[C]	0	--	--	na	1 3E+02	--	--	na	7 1E+02	--	--	--	--	--	--	--	--	--	--	na	**7.1E+02**
Chloroform	0	--	--	na	1 1E+04	--	--	na	6 0E+04	--	--	--	--	--	--	--	--	--	--	na	**6.0E+04**
2-Chloronaphthalene	0	--	--	na	1 6E+03	--	--	na	8 7E+03	--	--	--	--	--	--	--	--	--	--	na	**8.7E+03**
2-Chlorophenol	0	--	--	na	1 5E+02	--	--	na	8 1E+02	--	--	--	--	--	--	--	--	--	--	na	**8.1E+02**
Chlorpyrifos	0	8 3E-02	4 1E-02	na	--	8 3E-02	4 1E-02	na	--	--	--	--	--	--	--	--	--	**8.3E-02**	**4.1E-02**	na	--
Chromium III	0	3 2E+02	4 2E+01	na	--	3 2E+02	4 2E+01	na	--	--	--	--	--	--	--	--	--	**3.2E+02**	**4.2E+01**	na	--
Chromium VI	0	1 6E+01	1 1E+01	na	--	1 6E+01	1 1E+01	na	--	--	--	--	--	--	--	--	--	**1.6E+01**	**1.1E+01**	na	--
Chromium, Total	0	--	--	1 0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene[C]	0	--	--	na	1 8E-02	--	--	na	9 8E-02	--	--	--	--	--	--	--	--	--	--	na	**9.8E-02**
Copper	0	7 0E+00	5 0E+00	na	--	7.0E+00	5 0E+00	na	--	--	--	--	--	--	--	--	--	**7.0E+00**	**5.0E+00**	na	--
Cyanide, Free	0	2 2E+01	5 2E+00	na	1 6E+04	2 2E+01	5 2E+00	na	8 7E+04	--	--	--	--	--	--	--	--	**2.2E+01**	**5.2E+00**	na	**8.7E+04**
DDD[C]	0	--	--	na	3 1E-03	--	--	na	1 7E-02	--	--	--	--	--	--	--	--	--	--	na	**1.7E-02**
DDE[C]	0	--	--	na	2 2E-03	--	--	na	1 2E-02	--	--	--	--	--	--	--	--	--	--	na	**1.2E-02**
DDT[C]	0	1 1E+00	1 0E-03	na	2 2E-03	1 1E+00	1 0E-03	na	1 2E-02	--	--	--	--	--	--	--	--	**1.1E+00**	**1.0E-03**	na	**1.2E-02**
Demeton	0	--	1 0E-01	na	--	--	1 0E-01	na	--	--	--	--	--	--	--	--	--	--	**1.0E-01**	na	--
Diazinon	0	1 7E-01	1 7E-01	na	--	1 7E-01	1 7E-01	na	--	--	--	--	--	--	--	--	--	**1.7E-01**	**1.7E-01**	na	--
Dibenz(a,h)anthracene[C]	0	--	--	na	1 8E-01	--	--	na	9 8E-01	--	--	--	--	--	--	--	--	--	--	na	**9.8E-01**
1,2-Dichlorobenzene	0	--	--	na	1 3E+03	--	--	na	7 1E+03	--	--	--	--	--	--	--	--	--	--	na	**7.1E+03**
1,3-Dichlorobenzene	0	--	--	na	9 6E+02	--	--	na	5 2E+03	--	--	--	--	--	--	--	--	--	--	na	**5.2E+03**
1,4-Dichlorobenzene	0	--	--	na	1 9E+02	--	--	na	1 0E+03	--	--	--	--	--	--	--	--	--	--	na	**1.0E+03**
3,3-Dichlorobenzidine[C]	0	--	--	na	2 8E-01	--	--	na	1 5E+00	--	--	--	--	--	--	--	--	--	--	na	**1.5E+00**
Dichlorobromomethane[C]	0	--	--	na	1 7E+02	--	--	na	9 2E+02	--	--	--	--	--	--	--	--	--	--	na	**9.2E+02**
1,2-Dichloroethane[C]	0	--	--	na	3 7E+02	--	--	na	2 0E+03	--	--	--	--	--	--	--	--	--	--	na	**2.0E+03**
1,1-Dichloroethylene	0	--	--	na	7 1E+03	--	--	na	3 9E+04	--	--	--	--	--	--	--	--	--	--	na	**3.9E+04**
1,2-trans-dichloroethylene	0	--	--	na	1 0E+04	--	--	na	5 4E+04	--	--	--	--	--	--	--	--	--	--	na	**5.4E+04**
2,4-Dichlorophenol	0	--	--	na	2 9E+02	--	--	na	1 6E+03	--	--	--	--	--	--	--	--	--	--	na	**1.6E+03**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1 5E+02	--	--	na	8 1E+02	--	--	--	--	--	--	--	--	--	--	na	**8.1E+02**
1,3-Dichloropropene[C]	0	--	--	na	2 1E+02	--	--	na	1 1E+03	--	--	--	--	--	--	--	--	--	--	na	**1.1E+03**
Dieldrin[C]	0	2 4E-01	5 6E-02	na	5 4E-04	2 4E-01	5 6E-02	na	2 9E-03	--	--	--	--	--	--	--	--	**2.4E-01**	**5.6E-02**	na	**2.9E-03**
Diethyl Phthalate	0	--	--	na	4 4E+04	--	--	na	2 4E+05	--	--	--	--	--	--	--	--	--	--	na	**2.4E+05**
2,4-Dimethylphenol	0	--	--	na	8 5E+02	--	--	na	4 6E+03	--	--	--	--	--	--	--	--	--	--	na	**4.6E+03**
Dimethyl Phthalate	0	--	--	na	1 1E+06	--	--	na	6 0E+06	--	--	--	--	--	--	--	--	--	--	na	**6.0E+06**
Di-n-Butyl Phthalate	0	--	--	na	4 5E+03	--	--	na	2 4E+04	--	--	--	--	--	--	--	--	--	--	na	**2.4E+04**
2,4 Dinitrophenol	0	--	--	na	5 3E+03	--	--	na	2 9E+04	--	--	--	--	--	--	--	--	--	--	na	**2.9E+04**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2 8E+02	--	--	na	1 5E+03	--	--	--	--	--	--	--	--	--	--	na	**1.5E+03**
2,4-Dinitrotoluene[C]	0	--	--	na	3 4E+01	--	--	na	1 8E+02	--	--	--	--	--	--	--	--	--	--	na	**1.8E+02**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5 1E-08	--	--	na	2 8E-07	--	--	--	--	--	--	--	--	--	--	na	**2.8E-07**
1,2-Diphenylhydrazine[C]	0	--	--	na	2 0E+00	--	--	na	1 1E+01	--	--	--	--	--	--	--	--	--	--	na	**1.1E+01**
Alpha-Endosulfan	0	2 2E-01	5 6E-02	na	8 9E+01	2 2E-01	5 6E-02	na	4 8E+02	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	na	**4.8E+02**
Beta-Endosulfan	0	2 2E-01	5 6E-02	na	8 9E+01	2 2E-01	5 6E-02	na	4 8E+02	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	na	**4.8E+02**
Alpha + Beta Endosulfan	0	2 2E-01	5 6E-02	--	--	2 2E-01	5 6E-02	--	--	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	--	--
Endosulfan Sulfate	0	--	--	na	8 9E+01	--	--	na	4 8E+02	--	--	--	--	--	--	--	--	--	--	na	**4.8E+02**
Endrin	0	8 6E-02	3 6E-02	na	6 0E-02	8 6E-02	3 6E-02	na	3 3E-01	--	--	--	--	--	--	--	--	**8.6E-02**	**3.6E-02**	na	**3.3E-01**
Endrin Aldehyde	0	--	--	na	3 0E-01	--	--	na	1 6E+00	--	--	--	--	--	--	--	--	--	--	na	**1.6E+00**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Ethylbenzene	0	--	--	na	2 1E+03	--	--	na	1 1E+04	--	--	--	--	--	--	--	--	--	--	na	**1.1E+04**
Fluoranthene	0	--	--	na	1 4E+02	--	--	na	7 6E+02	--	--	--	--	--	--	--	--	--	--	na	**7.6E+02**
Fluorene	0	--	--	na	5 3E+03	--	--	na	2 9E+04	--	--	--	--	--	--	--	--	--	--	na	**2.9E+04**
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Guthion	0	--	1 0E-02	na	--	--	1 0E-02	na	--	--	--	--	--	--	--	--	--	--	**1.0E-02**	na	**--**
Heptachlor [c]	0	5 2E-01	3 8E-03	na	7 9E-04	5 2E-01	3 8E-03	na	4 3E-03	--	--	--	--	--	--	--	--	**5.2E-01**	**3.8E-03**	na	**4.3E-03**
Heptachlor Epoxide[c]	0	5 2E-01	3 8E-03	na	3 9E-04	5 2E-01	3 8E-03	na	2 1E-03	--	--	--	--	--	--	--	--	**5.2E-01**	**3.8E-03**	na	**2.1E-03**
Hexachlorobenzene[c]	0	--	--	na	2 9E-03	--	--	na	1.6E-02	--	--	--	--	--	--	--	--	--	--	na	**1.6E-02**
Hexachlorobutadiene[c]	0	--	--	na	1 8E+02	--	--	na	9 8E+02	--	--	--	--	--	--	--	--	--	--	na	**9.8E+02**
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	na	4 9E-02	--	--	na	2 7E-01	--	--	--	--	--	--	--	--	--	--	na	**2.7E-01**
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	na	1 7E-01	--	--	na	9 2E-01	--	--	--	--	--	--	--	--	--	--	na	**9.2E-01**
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9 5E-01	na	na	1 8E+00	9 5E-01	--	na	9 8E+00	--	--	--	--	--	--	--	--	**9.5E-01**	--	na	**9.8E+00**
Hexachlorocyclopentadiene	0	--	--	na	1 1E+03	--	--	na	6 0E+03	--	--	--	--	--	--	--	--	--	--	na	**6.0E+03**
Hexachloroethane[c]	0	--	--	na	3 3E+01	--	--	na	1 8E+02	--	--	--	--	--	--	--	--	--	--	na	**1.8E+02**
Hydrogen Sulfide	0	--	2 0E+00	na	--	--	2 0E+00	na	--	--	--	--	--	--	--	--	--	--	**2.0E+00**	na	**--**
Indeno (1,2,3-cd) pyrene [c]	0	--	--	na	1 8E-01	--	--	na	9 8E-01	--	--	--	--	--	--	--	--	--	--	na	**9.8E-01**
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Isophorone[c]	0	--	--	na	9 6E+03	--	--	na	5 2E+04	--	--	--	--	--	--	--	--	--	--	na	**5.2E+04**
Kepone	0	--	0 0E+00	na	--	--	0 0E+00	na	--	--	--	--	--	--	--	--	--	--	**0.0E+00**	na	**--**
Lead	0	4 9E+01	5 6E+00	na	--	4 9E+01	5 6E+00	na	--	--	--	--	--	--	--	--	--	**4.9E+01**	**5.6E+00**	na	**--**
Malathion	0	--	1 0E-01	na	--	--	1 0E-01	na	--	--	--	--	--	--	--	--	--	--	**1.0E-01**	na	**--**
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Mercury	0	1 4E+00	7 7E-01	--	--	1 4E+00	7 7E-01	--	--	--	--	--	--	--	--	--	--	**1.4E+00**	**7.7E-01**	--	**--**
Methyl Bromide	0	--	--	na	1 5E+03	--	--	na	8 1E+03	--	--	--	--	--	--	--	--	--	--	na	**8.1E+03**
Methylene Chloride [c]	0	--	--	na	5 9E+03	--	--	na	3 2E+04	--	--	--	--	--	--	--	--	--	--	na	**3.2E+04**
Methoxychlor	0	--	3 0E-02	na	--	--	3 0E-02	na	--	--	--	--	--	--	--	--	--	--	**3.0E-02**	na	**--**
Mirex	0	--	0 0E+00	na	--	--	0 0E+00	na	--	--	--	--	--	--	--	--	--	--	**0.0E+00**	na	**--**
Nickel	0	1 0E+02	1 1E+01	na	4 6E+03	1 0E+02	1 1E+01	na	2 5E+04	--	--	--	--	--	--	--	--	**1.0E+02**	**1.1E+01**	na	**2.5E+04**
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Nitrobenzene	0	--	--	na	6 9E+02	--	--	na	3 7E+03	--	--	--	--	--	--	--	--	--	--	na	**3.7E+03**
N-Nitrosodimethylamine[c]	0	--	--	na	3 0E+01	--	--	na	1 6E+02	--	--	--	--	--	--	--	--	--	--	na	**1.6E+02**
N-Nitrosodiphenylamine[c]	0	--	--	na	6 0E+01	--	--	na	3 3E+02	--	--	--	--	--	--	--	--	--	--	na	**3.3E+02**
N-Nitrosodi-n-propylamine[c]	0	--	--	na	5 1E+00	--	--	na	2 8E+01	--	--	--	--	--	--	--	--	--	--	na	**2.8E+01**
Nonylphenol	0	2 8E+01	6 6E+00	--	--	2 8E+01	6 6E+00	na	--	--	--	--	--	--	--	--	--	**2.8E+01**	**6.6E+00**	na	**--**
Parathion	0	6 5E-02	1 3E-02	na	--	6 5E-02	1 3E-02	na	--	--	--	--	--	--	--	--	--	**6.5E-02**	**1.3E-02**	na	**--**
PCB Total[c]	0	--	1 4E-02	na	6 4E-04	--	1 4E-02	na	3 5E-03	--	--	--	--	--	--	--	--	--	**1.4E-02**	na	**3.5E-03**
Pentachlorophenol [c]	0	7 7E-03	5 9E-03	na	3 0E+01	7 7E-03	5 9E-03	na	1 6E+02	--	--	--	--	--	--	--	--	**7.7E-03**	**5.9E-03**	na	**1.6E+02**
Phenol	0	--	--	na	8 6E+05	--	--	na	4 7E+06	--	--	--	--	--	--	--	--	--	--	na	**4.7E+06**
Pyrene	0	--	--	na	4 0E+03	--	--	na	2 2E+04	--	--	--	--	--	--	--	--	--	--	na	**2.2E+04**
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	**--**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2 0E+01	5 0E+00	na	4 2E+03	2 0E+01	5 0E+00	na	2 3E+04	--	--	--	--	--	--	--	--	**2.0E+01**	**5.0E+00**	**na**	**2.3E+04**
Silver	0	1 0E+00	--	na	--	1 0E+00	--	na	--	--	--	--	--	--	--	--	--	**1.0E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4 0E+01	--	--	na	2 2E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.2E+02**
Tetrachloroethylene[C]	0	--	--	na	3 3E+01	--	--	na	1 8E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.8E+02**
Thallium	0	--	--	na	4 7E-01	--	--	na	2 6E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.6E+00**
Toluene	0	--	--	na	6 0E+03	--	--	na	3 3E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.3E+04**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7 3E-01	2 0E-04	na	2 8E-03	7 3E-01	2 0E-04	na	1 5E-02	--	--	--	--	--	--	--	--	**7.3E-01**	**2.0E-04**	**na**	**1.5E-02**
Tributyltin	0	4 6E-01	7 2E-02	na	--	4 6E-01	7 2E-02	na	--	--	--	--	--	--	--	--	--	**4.6E-01**	**7.2E-02**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7 0E+01	--	--	na	3 8E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.8E+02**
1,1,2-Trichloroethane[C]	0	--	--	na	1 6E+02	--	--	na	8 7E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.7E+02**
Trichloroethylene [C]	0	--	--	na	3 0E+02	--	--	na	1 6E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+03**
2,4,6-Trichlorophenol [C]	0	--	--	na	2 4E+01	--	--	na	1 3E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.3E+02**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2 4E+01	--	--	na	1 3E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.3E+02**
Zinc	0	6 5E+01	6 6E+01	na	2 6E+04	6 5E+01	6 6E+01	na	1 4E+05	--	--	--	--	--	--	--	--	**6.5E+01**	**6.6E+01**	**na**	**1.4E+05**

Notes

1 All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise

2 Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals

3 Metals measured as Dissolved, unless specified otherwise

4 "C" indicates a carcinogenic parameter

5 Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information
Antidegradation WLAs are based upon a complete mix

6 Antideg Baseline = (0 25(WQC - background conc) + background conc) for acute and chronic
= (0 1(WQC - background conc) + background conc) for human health

7 WLAs established at the following stream flows 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix

Metal	Target Value (SSTV)
Antimony	3 5E+03
Arsenic	9 0E+01
Barium	na
Cadmium	3 9E-01
Chromium III	2 5E+01
Chromium VI	6 4E+00
Copper	2 8E+00
Iron	na
Lead	3 4E+00
Manganese	na
Mercury	4 6E-01
Nickel	6 8E+00
Selenium	3 0E+00
Silver	4 2E-01
Zinc	2 6E+01

Note do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Birchwood Power Facility Permit No.. VA0087645

Receiving Stream. Rappahannock River - Chronic Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	mg/L	1Q10 (Annual) =	49 MGD	Annual - 1Q10 Mix =	0 %	Mean Hardness (as CaCO3) =	50 mg/L
90% Temperature (Annual) =	deg C	7Q10 (Annual) =	49 MGD	- 7Q10 Mix =	0 %	90% Temp (Annual) =	25 deg C
90% Temperature (Wet season) =	deg C	30Q10 (Annual) =	49 MGD	- 30Q10 Mix =	0 %	90% Temp (Wet season) =	deg C
90% Maximum pH =	SU	1Q10 (Wet season) =	49 MGD	Wet Season - 1Q10 Mix =	0 %	90% Maximum pH =	8 SU
10% Maximum pH =	SU	30Q10 (Wet season)	49 MGD	- 30Q10 Mix =	0 %	10% Maximum pH =	SU
Tier Designation (1 or 2) =	1	30Q5 =	49 MGD			Discharge Flow =	1 MGD
Public Water Supply (PWS) Y/N? =	n	Harmonic Mean =	49 MGD				
Trout Present Y/N? =	n						
Early Life Stages Present Y/N? =	y						

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	na	9 9E+02	--	--	na	5 0E+04	--	--	--	--	--	--	--	--	--	--	na	5.0E+04
Acrolein	0	--	--	na	9 3E+00	--	--	na	4 7E+02	--	--	--	--	--	--	--	--	--	--	na	4.7E+02
Acrylonitrile[C]	0	--	--	na	2 5E+00	--	--	na	1 3E+02	--	--	--	--	--	--	--	--	--	--	na	1.3E+02
Aldrin [C]	0	3 0E+00	--	na	5 0E-04	3 0E+00	--	na	2 5E-02	--	--	--	--	--	--	--	--	3.0E+00	--	na	2.5E-02
Ammonia-N (mg/l) (Yearly)	0	8 41E+00	1 24E+00	na	--	8 41E+00	1 24E+00	na	--	--	--	--	--	--	--	--	--	8.41E+00	1.24E+00	na	--
Ammonia-N (mg/l) (High Flow)	0	8 41E+00	2 43E+00	na	--	8 41E+00	2 43E+00	na	--	--	--	--	--	--	--	--	--	8.41E+00	2.43E+00	na	--
Anthracene	0	--	--	na	4 0E+04	--	--	na	2 0E+06	--	--	--	--	--	--	--	--	--	--	na	2.0E+06
Antimony	0	--	--	na	6 4E+02	--	--	na	3 2E+04	--	--	--	--	--	--	--	--	--	--	na	3.2E+04
Arsenic	0	3 4E+02	1 5E+02	na	--	3 4E+02	1 5E+02	na	--	--	--	--	--	--	--	--	--	3.4E+02	1.5E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene [C]	0	--	--	na	5 1E+02	--	--	na	2 6E+04	--	--	--	--	--	--	--	--	--	--	na	2.6E+04
Benzidine[C]	0	--	--	na	2 0E-03	--	--	na	1 0E-01	--	--	--	--	--	--	--	--	--	--	na	1.0E-01
Benzo (a) anthracene [C]	0	--	--	na	1 8E-01	--	--	na	9 0E+00	--	--	--	--	--	--	--	--	--	--	na	9.0E+00
Benzo (b) fluoranthene [C]	0	--	--	na	1 8E-01	--	--	na	9 0E+00	--	--	--	--	--	--	--	--	--	--	na	9.0E+00
Benzo (k) fluoranthene [C]	0	--	--	na	1 8E-01	--	--	na	9 0E+00	--	--	--	--	--	--	--	--	--	--	na	9.0E+00
Benzo (a) pyrene [C]	0	--	--	na	1 8E-01	--	--	na	9 0E+00	--	--	--	--	--	--	--	--	--	--	na	9.0E+00
Bis2-Chloroethyl Ether [C]	0	--	--	na	5 3E+00	--	--	na	2 7E+02	--	--	--	--	--	--	--	--	--	--	na	2.7E+02
Bis2-Chloroisopropyl Ether	0	--	--	na	6 5E+04	--	--	na	3 3E+06	--	--	--	--	--	--	--	--	--	--	na	3.3E+06
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2 2E+01	--	--	na	1 1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03
Bromoform [C]	0	--	--	na	1 4E+03	--	--	na	7 0E+04	--	--	--	--	--	--	--	--	--	--	na	7.0E+04
Butylbenzylphthalate	0	--	--	na	1 9E+03	--	--	na	9 5E+04	--	--	--	--	--	--	--	--	--	--	na	9.5E+04
Cadmium	0	1 8E+00	6 6E-01	na	--	1 8E+00	6 6E-01	na	--	--	--	--	--	--	--	--	--	1.8E+00	6.6E-01	na	--
Carbon Tetrachloride [C]	0	--	--	na	1 6E+01	--	--	na	8 0E+02	--	--	--	--	--	--	--	--	--	--	na	8.0E+02
Chlordane [C]	0	2 4E+00	4 3E-03	na	8 1E-03	2 4E+00	4 3E-03	na	4 1E-01	--	--	--	--	--	--	--	--	2.4E+00	4.3E-03	na	4.1E-01
Chloride	0	8 6E+05	2 3E+05	na	--	8 6E+05	2 3E+05	na	--	--	--	--	--	--	--	--	--	8.6E+05	2.3E+05	na	--
TRC	0	1 9E+01	1 1E+01	na	--	1 9E+01	1 1E+01	na	--	--	--	--	--	--	--	--	--	1.9E+01	1.1E+01	na	--
Chlorobenzene	0	--	--	na	1 6E+03	--	--	na	8 0E+04	--	--	--	--	--	--	--	--	--	--	na	8.0E+04

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	na	1 3E+02	--	--	na	6 5E+03	--	--	--	--	--	--	--	--	--	--	na	6.5E+03
Chloroform	0	--	--	na	1 1E+04	--	--	na	5 5E+05	--	--	--	--	--	--	--	--	--	--	na	5.5E+05
2-Chloronaphthalene	0	--	--	na	1 6E+03	--	--	na	8 0E+04	--	--	--	--	--	--	--	--	--	--	na	8.0E+04
2-Chlorophenol	0	--	--	na	1 5E+02	--	--	na	7 5E+03	--	--	--	--	--	--	--	--	--	--	na	7.5E+03
Chlorpyrifos	0	8 3E-02	4 1E-02	na	--	8 3E-02	4 1E-02	na	--	--	--	--	--	--	--	--	--	8.3E-02	4.1E-02	na	--
Chromium III	0	3 2E+02	4 2E+01	na	--	3 2E+02	4 2E+01	na	--	--	--	--	--	--	--	--	--	3.2E+02	4.2E+01	na	--
Chromium VI	0	1 6E+01	1 1E+01	na	--	1 6E+01	1 1E+01	na	--	--	--	--	--	--	--	--	--	1.6E+01	1.1E+01	na	--
Chromium, Total	0	--	--	1 0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene [C]	0	--	--	na	1 8E-02	--	--	na	9 0E-01	--	--	--	--	--	--	--	--	--	--	na	9.0E-01
Copper	0	7 0E+00	5 0E+00	na	--	7 0E+00	5 0E+00	na	--	--	--	--	--	--	--	--	--	7.0E+00	5.0E+00	na	--
Cyanide, Free	0	2 2E+01	5 2E+00	na	1 6E+04	2 2E+01	5 2E+00	na	8 0E+05	--	--	--	--	--	--	--	--	2.2E+01	5.2E+00	na	8.0E+05
DDD [C]	0	--	--	na	3 1E-03	--	--	na	1 6E-01	--	--	--	--	--	--	--	--	--	--	na	1.6E-01
DDE [C]	0	--	--	na	2 2E-03	--	--	na	1 1E-01	--	--	--	--	--	--	--	--	--	--	na	1.1E-01
DDT [C]	0	1 1E+00	1 0E-03	na	2 2E-03	1 1E+00	1 0E-03	na	1 1E-01	--	--	--	--	--	--	--	--	1.1E+00	1.0E-03	na	1.1E-01
Demeton	0	--	1 0E-01	na	--	--	1 0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Diazinon	0	1 7E-01	1 7E-01	na	--	1 7E-01	1 7E-01	na	--	--	--	--	--	--	--	--	--	1.7E-01	1.7E-01	na	--
Dibenz(a,h)anthracene [C]	0	--	--	na	1 8E-01	--	--	na	9 0E+00	--	--	--	--	--	--	--	--	--	--	na	9.0E+00
1,2-Dichlorobenzene	0	--	--	na	1 3E+03	--	--	na	6 5E+04	--	--	--	--	--	--	--	--	--	--	na	6.5E+04
1,3-Dichlorobenzene	0	--	--	na	9 6E+02	--	--	na	4 8E+04	--	--	--	--	--	--	--	--	--	--	na	4.8E+04
1,4-Dichlorobenzene	0	--	--	na	1 9E+02	--	--	na	9 5E+03	--	--	--	--	--	--	--	--	--	--	na	9.5E+03
3,3-Dichlorobenzidine[C]	0	--	--	na	2 8E-01	--	--	na	1 4E+01	--	--	--	--	--	--	--	--	--	--	na	1.4E+01
Dichlorobromomethane [C]	0	--	--	na	1 7E+02	--	--	na	8 5E+03	--	--	--	--	--	--	--	--	--	--	na	8.5E+03
1,2-Dichloroethane [C]	0	--	--	na	3 7E+02	--	--	na	1 9E+04	--	--	--	--	--	--	--	--	--	--	na	1.9E+04
1,1-Dichloroethylene	0	--	--	na	7 1E+03	--	--	na	3 6E+05	--	--	--	--	--	--	--	--	--	--	na	3.6E+05
1,2-trans-dichloroethylene	0	--	--	na	1 0E+04	--	--	na	5 0E+05	--	--	--	--	--	--	--	--	--	--	na	5.0E+05
2,4-Dichlorophenol	0	--	--	na	2 9E+02	--	--	na	1 5E+04	--	--	--	--	--	--	--	--	--	--	na	1.5E+04
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1 5E+02	--	--	na	7 5E+03	--	--	--	--	--	--	--	--	--	--	na	7.5E+03
1,3-Dichloropropene [C]	0	--	--	na	2 1E+02	--	--	na	1 1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+04
Dieldrin [C]	0	2 4E-01	5 6E-02	na	5 4E-04	2 4E-01	5 6E-02	na	2 7E-02	--	--	--	--	--	--	--	--	2.4E-01	5.6E-02	na	2.7E-02
Diethyl Phthalate	0	--	--	na	4 4E+04	--	--	na	2 2E+06	--	--	--	--	--	--	--	--	--	--	na	2.2E+06
2,4-Dimethylphenol	0	--	--	na	8 5E+02	--	--	na	4 3E+04	--	--	--	--	--	--	--	--	--	--	na	4.3E+04
Dimethyl Phthalate	0	--	--	na	1 1E+06	--	--	na	5 5E+07	--	--	--	--	--	--	--	--	--	--	na	5.5E+07
Di-n-Butyl Phthalate	0	--	--	na	4 5E+03	--	--	na	2 3E+05	--	--	--	--	--	--	--	--	--	--	na	2.3E+05
2,4 Dinitrophenol	0	--	--	na	5 3E+03	--	--	na	2 7E+05	--	--	--	--	--	--	--	--	--	--	na	2.7E+05
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2 8E+02	--	--	na	1 4E+04	--	--	--	--	--	--	--	--	--	--	na	1.4E+04
2,4-Dinitrotoluene [C]	0	--	--	na	3 4E+01	--	--	na	1 7E+03	--	--	--	--	--	--	--	--	--	--	na	1.7E+03
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5 1E-08	--	--	na	2 6E-06	--	--	--	--	--	--	--	--	--	--	na	2.6E-06
1,2-Diphenylhydrazine[C]	0	--	--	na	2 0E+00	--	--	na	1 0E+02	--	--	--	--	--	--	--	--	--	--	na	1.0E+02
Alpha-Endosulfan	0	2 2E-01	5 6E-02	na	8 9E+01	2 2E-01	5 6E-02	na	4 5E+03	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	4.5E+03
Beta-Endosulfan	0	2 2E-01	5 6E-02	na	8.9E+01	2 2E-01	5.6E-02	na	4 5E+03	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	4.5E+03
Alpha + Beta Endosulfan	0	2 2E-01	5 6E-02	--	--	2 2E-01	5 6E-02	--	--	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	--	--
Endosulfan Sulfate	0	--	--	na	8 9E+01	--	--	na	4.5E+03	--	--	--	--	--	--	--	--	--	--	na	4.5E+03
Endrin	0	8 6E-02	3 6E-02	na	6 0E-02	8 6E-02	3 6E-02	na	3 0E+00	--	--	--	--	--	--	--	--	8.6E-02	3.6E-02	na	3.0E+00
Endrin Aldehyde	0	--	--	na	3 0E-01	--	--	na	1 5E+01	--	--	--	--	--	--	--	--	--	--	na	1.5E+01

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2 1E+03	--	--	na	1 1E+05	--	--	--	--	--	--	--	--	--	--	na	1.1E+05
Fluoranthene	0	--	--	na	1 4E+02	--	--	na	7 0E+03	--	--	--	--	--	--	--	--	--	--	na	7.0E+03
Fluorene	0	--	--	na	5 3E+03	--	--	na	2 7E+05	--	--	--	--	--	--	--	--	--	--	na	2.7E+05
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1 0E-02	na	--	--	1 0E-02	na	--	--	--	--	--	--	--	--	--	--	1.0E-02	na	--
Heptachlor [c]	0	5 2E-01	3 8E-03	na	7 9E-04	5 2E-01	3 8E-03	na	4 0E-02	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	4.0E-02
Heptachlor Epoxide[c]	0	5 2E-01	3 8E-03	na	3 9E-04	5 2E-01	3 8E-03	na	2 0E-02	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	2.0E-02
Hexachlorobenzene[c]	0	--	--	na	2 9E-03	--	--	na	1 5E-01	--	--	--	--	--	--	--	--	--	--	na	1.5E-01
Hexachlorobutadiene[c]	0	--	--	na	1 8E+02	--	--	na	9 0E+03	--	--	--	--	--	--	--	--	--	--	na	9.0E+03
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	na	4 9E-02	--	--	na	2 5E+00	--	--	--	--	--	--	--	--	--	--	na	2.5E+00
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	na	1 7E-01	--	--	na	8 5E+00	--	--	--	--	--	--	--	--	--	--	na	8.5E+00
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9 5E-01	na	na	1 8E+00	9 5E-01	--	na	9 0E+01	--	--	--	--	--	--	--	--	9.5E-01	--	na	9.0E+01
Hexachlorocyclopentadiene	0	--	--	na	1 1E+03	--	--	na	5 5E+04	--	--	--	--	--	--	--	--	--	--	na	5.5E+04
Hexachloroethane[c]	0	--	--	na	3 3E+01	--	--	na	1 7E+03	--	--	--	--	--	--	--	--	--	--	na	1.7E+03
Hydrogen Sulfide	0	--	2 0E+00	na	--	--	2 0E+00	na	--	--	--	--	--	--	--	--	--	--	2.0E+00	na	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	na	1 8E-01	--	--	na	9 0E+00	--	--	--	--	--	--	--	--	--	--	na	9.0E+00
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone[c]	0	--	--	na	9 6E+03	--	--	na	4 8E+05	--	--	--	--	--	--	--	--	--	--	na	4.8E+05
Kepone	0	--	0 0E+00	na	--	--	0 0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	4 9E+01	5 6E+00	na	--	4 9E+01	5 6E+00	na	--	--	--	--	--	--	--	--	--	4.9E+01	5.6E+00	na	--
Malathion	0	--	1 0E-01	na	--	--	1 0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1 4E+00	7 7E-01	--	--	1 4E+00	7 7E-01	--	--	--	--	--	--	--	--	--	--	1.4E+00	7.7E-01	--	--
Methyl Bromide	0	--	--	na	1 5E+03	--	--	na	7 5E+04	--	--	--	--	--	--	--	--	--	--	na	7.5E+04
Methylene Chloride [c]	0	--	--	na	5 9E+03	--	--	na	3 0E+05	--	--	--	--	--	--	--	--	--	--	na	3.0E+05
Methoxychlor	0	--	3 0E-02	na	--	--	3 0E-02	na	--	--	--	--	--	--	--	--	--	--	3.0E-02	na	--
Mirex	0	--	0 0E+00	na	--	--	0 0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Nickel	0	1 0E+02	1 1E+01	na	4 6E+03	1 0E+02	1 1E+01	na	2 3E+05	--	--	--	--	--	--	--	--	1.0E+02	1.1E+01	na	2.3E+05
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6 9E+02	--	--	na	3 5E+04	--	--	--	--	--	--	--	--	--	--	na	3.5E+04
N-Nitrosodimethylamine[c]	0	--	--	na	3 0E+01	--	--	na	1 5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+03
N-Nitrosodiphenylamine[c]	0	--	--	na	6 0E+01	--	--	na	3 0E+03	--	--	--	--	--	--	--	--	--	--	na	3.0E+03
N-Nitrosodi-n-propylamine[c]	0	--	--	na	5 1E+00	--	--	na	2 6E+02	--	--	--	--	--	--	--	--	--	--	na	2.6E+02
Nonylphenol	0	2 8E+01	6 6E+00	--	--	2 8E+01	6 6E+00	na	--	--	--	--	--	--	--	--	--	2.8E+01	6.6E+00	na	--
Parathion	0	6 5E-02	1 3E-02	na	--	6 5E-02	1 3E-02	na	--	--	--	--	--	--	--	--	--	6.5E-02	1.3E-02	na	--
PCB Total[c]	0	--	1 4E-02	na	6 4E-04	--	1 4E-02	na	3 2E-02	--	--	--	--	--	--	--	--	--	1.4E-02	na	3.2E-02
Pentachlorophenol [c]	0	7 7E-03	5 9E-03	na	3 0E+01	7 7E-03	5 9E-03	na	1 5E+03	--	--	--	--	--	--	--	--	7.7E-03	5.9E-03	na	1.5E+03
Phenol	0	--	--	na	8 6E+05	--	--	na	4 3E+07	--	--	--	--	--	--	--	--	--	--	na	4.3E+07
Pyrene	0	--	--	na	4 0E+03	--	--	na	2 0E+05	--	--	--	--	--	--	--	--	--	--	na	2.0E+05
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2 0E+01	5 0E+00	na	4 2E+03	2 0E+01	5 0E+00	na	2 1E+05	--	--	--	--	--	--	--	--	**2.0E+01**	**5.0E+00**	**na**	**2.1E+05**
Silver	0	1 0E+00	--	na	--	1 0E+00	--	na	--	--	--	--	--	--	--	--	--	**1.0E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4 0E+01	--	--	na	2 0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.0E+03**
Tetrachloroethylene[C]	0	--	--	na	3 3E+01	--	--	na	1 7E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.7E+03**
Thallium	0	--	--	na	4 7E-01	--	--	na	2 4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+01**
Toluene	0	--	--	na	6 0E+03	--	--	na	3 0E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.0E+05**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7 3E-01	2 0E-04	na	2 8E-03	7 3E-01	2 0E-04	na	1 4E-01	--	--	--	--	--	--	--	--	**7.3E-01**	**2.0E-04**	**na**	**1.4E-01**
Tributyltin	0	4 6E-01	7 2E-02	na	--	4 6E-01	7 2E-02	na	--	--	--	--	--	--	--	--	--	**4.6E-01**	**7.2E-02**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7 0E+01	--	--	na	3 5E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.5E+03**
1,1,2-Trichloroethane[C]	0	--	--	na	1 6E+02	--	--	na	8 0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.0E+03**
Trichloroethylene [C]	0	--	--	na	3 0E+02	--	--	na	1 5E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.5E+04**
2,4,6-Trichlorophenol [C]	0	--	--	na	2 4E+01	--	--	na	1 2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+03**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2 4E+01	--	--	na	1 2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+03**
Zinc	0	6 5E+01	6 6E+01	na	2 6E+04	6 5E+01	6 6E+01	na	1 3E+06	--	--	--	--	--	--	--	--	**6.5E+01**	**6.6E+01**	**na**	**1.3E+06**

Notes

1 All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise

2 Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals

3 Metals measured as Dissolved, unless specified otherwise

4 "C" indicates a carcinogenic parameter

5 Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information
Antidegradation WLAs are based upon a complete mix

6 Antideg Baseline = (0 25(WQC - background conc) + background conc) for acute and chronic
= (0 1(WQC - background conc) + background conc) for human health

7 WLAs established at the following stream flows 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix

Metal	Target Value (SSTV)
Antimony	3 2E+04
Arsenic	9 0E+01
Barium	na
Cadmium	3 9E-01
Chromium III	2 5E+01
Chromium VI	6 4E+00
Copper	2 8E+00
Iron	na
Lead	3 4E+00
Manganese	na
Mercury	4 6E-01
Nickel	6 8E+00
Selenium	3 0E+00
Silver	4 2E-01
Zinc	2 6E+01

Note do not use QL's lower than the minimum QL's provided in agency guidance

2/29/2016 11:02:53 AM

Facility = Birchwood Power Plant
Chemical = Total Residual Chlorine
Chronic averaging period = 4
WLAa = 0.019 mg/l
WLAc = 0.011 mg/l
Q.L. = 0.1 mg/l
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = .2
Variance = .0144
C.V. = 0.6
97th percentile daily values = .486683
97th percentile 4 day average = .332758
97th percentile 30 day average= .241210
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 1.60883226245855E-02
Average Weekly limit = 1.60883226245855E-02
Average Monthly LImit = 1.60883226245855E-02

The data are:

0.2 mg/l

Spreadsheet for determination of WET test endpoints or WET limits

	Excel 97			Acute Endpoint/Permit Limit			Use as LC_{50} in Special Condition, as TUa on DMR								
	Revision Date: 12/13/13														
	File: WETLIM10.xls			ACUTE	1.62900004	TUa	LC_{50} =	62	% Use as	1.61	TUa				
	(MIX.EXE required also)														
				ACUTE WLAa		1.629	Note Inform the permittee that if the mean of the data exceeds								
							this TUa	1 0		a limit may result using STATS EXE					
				Chronic Endpoint/Permit Limit			Use as NOEC in Special Condition, as TUc on DMR								
				CHRONIC	16.2900004	TU_c	NOEC =	7	% Use as	14.28	TU_c				
				BOTH*	16.2900004	TU_c	NOEC =	7	% Use as	14.28	TU_c				
	Enter data in the cells with blue type:			AML	16.2900004	TU_c	NOEC =	7	% Use as	14.28	TU_c				
	Entry Date	03/28/16		ACUTE WLAa,c		16.29		Note Inform the permittee that if the mean							
	Facility Name	Birchwood		CHRONIC WLAc		50		of the data exceeds this TUc				6.69428885			
	VPDES Number	VA0008745		* Both means acute expressed as chronic				a limit may result using STATS EXE							
	Outfall Number	1													
				% Flow to be used from MIX.EXE				Diffuser /modeling study?							
	Plant Flow	1	MGD					Enter Y/N	y						
	Acute 1Q10	0	MGD	100	%			Acute	5 43	1					
	Chronic 7Q10	0	MGD	100	%			Chronic	50	1					
	Are data available to calculate CV? (Y/N)			N	(Minimum of 10 data points, same species, needed)					Go to Page 2					
	Are data available to calculate ACR? (Y/N)			N	(NOEC<LC50, do not use greater/less than data)					Go to Page 3					
	IWC_a	18 41620626	%	Plant flow/plant flow + 1Q10			NOTE. If the IWCa is >33%, specify the								
	IWC_c	2	%	Plant flow/plant flow + 7Q10			NOAEC = 100% test/endpoint for use								
	Dilution, acute	5 43		100/IWCa											
	Dilution, chronic	50		100/IWCc											
	WLA_a	1 629		Instream criterion (0 3 TUa) X's Dilution, acute											
	WLA_c	50		Instream criterion (1.0 TUc) X's Dilution, chronic											
	$WLA_{a,c}$	16 29		ACR X's WLA_a - converts acute WLA to chronic units											
	ACR -acute-chronic ratio	10		LC50/NOEC (Default is 10 - if data are available, use tables Page 3)											
	CV-Coefficient of variation	0 6		Default of 0 6 - if data are available, use tables Page 2)											
	Constants eA	0 4109447		Default = 0 41											
	eB	0 6010373		Default = 0 60											
	eC	2 4334175		Default = 2.43											
	eD	2 4334175		Default = 2.43 (1 samp)	No of sample	1	**The Maximum Daily Limit is calculated from the lowest								
							LTA, X's eC. The LTAa,c and MDL using it are driven by the ACR.								
	$LTA_{a,c}$	6 694289163		WLAa,c X's eA											
	LTA_c	30 051865		WLAc X's eB							Rounded NOEC's		%		
	MDL** with $LTA_{a,c}$	16 2900004	TU_c	NOEC =	6 138735		(Protects from acute/chronic toxicity)				NOEC =	7	%		
	MDL** with LTA_c	73 1287342	TU_c	NOEC =	1 367452		(Protects from chronic toxicity)				NOEC =	2	%		
	AML with lowest LTA	16 2900004	TU_c	NOEC =	6 138735		Lowest LTA X's eD				NOEC =	7			
	IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU_c to TU_a														
											Rounded LC50's		%		
	MDL with $LTA_{a,c}$	1 62900004	TU_a	LC50 =	61.387353	%					LC50 =	62	%		
	MDL with LTA_c	7 31287342	TU_a	LC50 =	13 674515	%					LC50 =	14			

Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)

IF YOU HAVE AT LEAST 10 DATA POINTS THAT					Vertebrate			Invertebrate					
ARE QUANTIFIABLE (NOT "<" OR ">")					IC_{25} Data			IC_{25} Data					
FOR A SPECIES, ENTER THE DATA IN EITHER					or			or					
COLUMN "G" (VERTEBRATE) OR COLUMN					LC_{50} Data	LN of data		LC_{50} Data	LN of data				
"J" (INVERTEBRATE). THE 'CV' WILL BE					**********			**********					
PICKED UP FOR THE CALCULATIONS				1			1						
BELOW THE DEFAULT VALUES FOR eA,				2			2						
eB, AND eC WILL CHANGE IF THE 'CV' IS				3			3						
ANYTHING OTHER THAN 0 6				4			4						
				5			5						
				6			6						
				7			7						
Coefficient of Variation for effluent tests				8			8						
				9			9						
CV =	0 6	(Default 0 6)		10			10						
				11			11						
δ^2 =	0 3074847			12			12						
δ =	0 554513029			13			13						
				14			14						
Using the log variance to develop eA				15			15						
	(P 100, step 2a of TSD)			16			16						
Z = 1 881 (97% probability stat from table				17			17						
A =	-0 88929666			18			18						
eA =	0 410944686			19			19						
				20			20						
Using the log variance to develop eB													
	(P 100, step 2b of TSD)			St Dev	NEED DATA	NEED DATA	St Dev	NEED DATA	NEED DATA				
δ_4^2 =	0 086177696			Mean	0	0	Mean	0	0				
δ_4 =	0 293560379			Variance	0	0 000000	Variance	0	0 000000				
B =	-0 50909823			CV	0		CV	0					
eB =	0 601037335												
Using the log variance to develop eC													
	(P 100, step 4a of TSD)												
δ^2 =	0 3074847												
δ =	0 554513029												
C =	0 889296658												
eC =	2 433417525												
Using the log variance to develop eD													
	(P 100, step 4b of TSD)												
n =	1	This number will most likely stay as "1", for 1 sample/month											
δ_n^2 =	0 3074847												
δ_n =	0 554513029												
D =	0 889296658												
eD =	2.433417525												

Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)

To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species The chronic NOEC must be less than the acute LC_{50}, since the ACR divides the LC_{50} by the NOEC LC_{50}'s >100% should not be used.

Table 1. ACR using Vertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data			0

Table 1 Result	Vertebrate ACR	0
Table 2 Result	Invertebrate ACR	0
	Lowest ACR	Default to 10

Table 2. ACR using Invertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data			0

DILUTION SERIES TO RECOMMEND

Table 4.

	Monitoring		Limit	
	% Effluent	TUc	% Effluent	TUc
Dilution series based on data mean	14 9	6 694289		
Dilution series to use for limit			7	14 285714
Dilution factor to recommend	0 3864985		0 2645751	
Dilution series to recommend	100.0	1.00	100 0	1.00
	38.6	2 59	26.5	3 78
	14.9	6.69	7 0	14 29
	5 8	17.32	1 9	53.99
	2 23	44.81	0.5	204.08
Extra dilutions if needed	0 86	115.95	0.1	771.36
	0.33	299.99	0.0	2915 45

Convert LC_{50}'s and NOEC's to Chronic TU's for use in WLA.EXE

Table 3. ACR used: 10

	Enter LC_{50}	TUc	Enter NOEC	TUc
1		NO DATA		NO DATA
2		NO DATA		NO DATA
3		NO DATA		NO DATA
4		NO DATA		NO DATA
5		NO DATA		NO DATA
6		NO DATA		NO DATA
7		NO DATA		NO DATA
8		NO DATA		NO DATA
9		NO DATA		NO DATA
10		NO DATA		NO DATA
11		NO DATA		NO DATA
12		NO DATA		NO DATA
13		NO DATA		NO DATA
14		NO DATA		NO DATA
15		NO DATA		NO DATA
16		NO DATA		NO DATA
17		NO DATA		NO DATA
18		NO DATA		NO DATA
19		NO DATA		NO DATA
20		NO DATA		NO DATA

If WLA EXE determines that an acute limit is needed, you need to convert the TUc answer you get to TUa and then an LC50,

enter it here		NO DATA	$\%LC_{50}$
		NO DATA	TUa

Cell I9
Comment
This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">")

Cell K18
Comment This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">")

Cell J22
Comment Remember to change the "N to "Y" if you have ratios entered, otherwise, they won't be used in the calculations

Cell C40
Comment
If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10 , make sure you have selected "Y" in cell E21

Cell C41
Comment If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0 6", make sure you have selected "Y" in cell E20

Cell L48
Comment
See Row 151 for the appropriate dilution series to use for these NOEC's

Cell G62
Comment
Vertebrates are
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell J62
Comment:
Invertebrates are
Ceriodaphnia dubia
Mysidopsis bahia

Cell C117
Comment Vertebrates are

Pimephales promelas
Cyprinodon variegatus

Cell M119
Comment. The ACR has been picked up from cell C34 on Page 1 If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1 Otherwise, the default of 10 will be used to convert your acute data

Cell: M121
Comment If you are only concerned with acute data you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TUa The calculation is the same 100/NOEC = TUc or 100/LC50 = TUa

Cell C138
Comment. Invertebrates are

Ceriodaphnia dubia
Mysidopsis bahia

Mackert, Susan (DEQ)

From: Jones, Carla [Carla.Jones@naes.com]
Sent: Tuesday, September 30, 2014 9:26 AM
To: Mackert, Susan (DEQ)
Cc: Belden, Roy S (GE Capital); Gill, Valarie; Caiafa, Julie
Subject: Birchwood 316 (b) Info
Attachments: Birchwood Intake Structure Description.pdf; Army COE April 12 1993 Letter Modification Request Response pdf; drawing intakedischarge structure.pdf

Hi Susan,
Attached are some background documents that may be helpful for our call.

To summarize our intake/discharge in a few bullet points:

- Permitted and designed to max slot velocity of < 0.25 ft/sec
- Permitted intake flow 6.6 MGD
- Facility used at least 25% of water withdrawn exclusively for cooling purposes – closed loop cooling system
- Two 5,000 gpm pumps designed to run separately – logic programmed
- Average annual water intake flow of 0.44 MGD
- Withdraws from Rappahannock River
- Screen type – cylindrical wedgewire screen
- Screen slot size < 1 mm Nominal 0.39 mm (<1 mm required by permit)

I'll be happy to send any other documents as requested. Looking forward to talking to you soon.

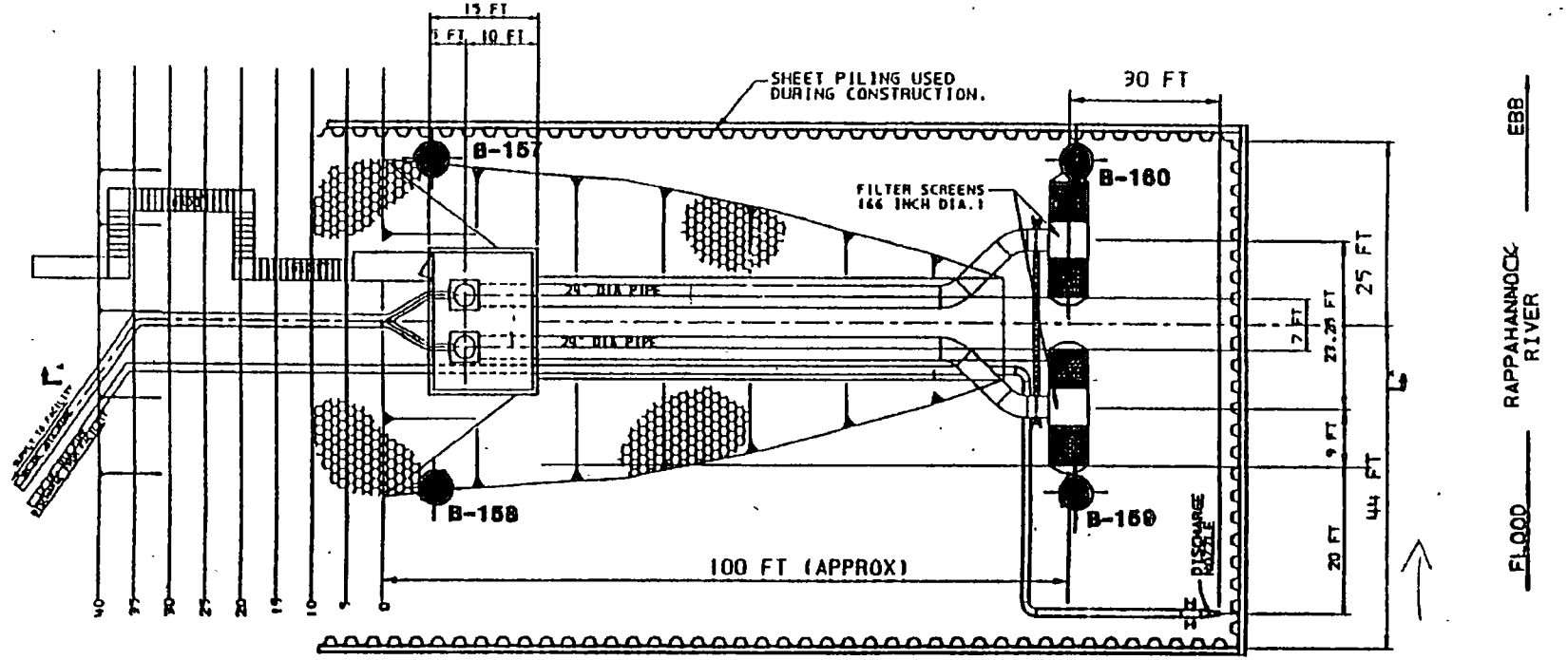
Regards,

Carla S. Jones
Environmental Manager
NAES Corporation

T: 540-775-6304
C: 540-220-8399
E: Carla.jones@naes.com

Birchwood Power Facility
10900 Birchwood Drive
King George, VA 22485

REVISED DRAWINGS
PROJECT 91-1682-12
VMRC RECD 4-5-93



PLAN VIEW OF:
INTAKE/ DISCHARGE STRUCTURE
DATUM: MLW
IN: RAPPAHANNOCK RIVER
AT: MOSS NECK
COUNTY: KING GEORGE, VIRGINIA

APPLICATION BY: BIRCHWOOD POWER PARTNERS L.P.
DATE: NOVEMBER, 1991

NOTES:
SLOT SIZE ≤ 1MM (.39 NOMINAL)
SLOT VELOCITY < .25 FT/SEC.
SCREEN AXIS - PARALLEL W/ RIVER FLOW
Q(NOM) - 4600 - 5000 GPM
Q(MAX) - 6400 GPM

INDICATES TOP OF CUT AREAS.

SCALE
25 FEET

EXPLANATION
B-160 BOREHOLE LOCATION AND DESIGNATION

SOURCE:
SOUTHERN COMPANY SERVICES, INC., 1992

INTAKE / DISCHARGE STRUCTURE

PROJECT		SCALE: AS SHOWN
SEI BIRCHWOOD POWER FACILITY KING GEORGE COUNTY, VIRGINIA	RUST ENVIRONMENT & INFRASTRUCTURE	JOB NO: RM182.43
		FIG NO:

SHEET 1

Attachment 11
Page 2 of 6

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT, CORPS OF ENGINEERS
FORT NORFOLK, 803 FRONT STREET
NORFOLK, VIRGINIA 23510-1096

REPLY TO
ATTENTION OF:

April 12, 1993

Northern Virginia Regulatory Section
(Rappahannock River)
91-1692-45

Birchwood Power Partners, LP
c/o Mr. Robert Smiley
Rust Environment & Infrastructure Inc.
2800 East Parham Road
Richmond, Virginia 23228

Dear Mr. Smiley:

This is in reference to your request for a modification to the Corps permit number 91-1692-45 for an intake/discharge structure for the SEI Birchwood Power Facility in King George County, Virginia.

Based on a condition of the Virginia Water Protection Permit (WPP), your plans and specifications for the intake/discharge structure have been modified. The WPP required that the slot size for the intake screens be reduced from 2mm to 1mm and that the intake velocity be reduced to a maximum of 0.25 feet per second (fps). Based on these specifications, the discharge nozzle was moved 20 feet upstream to to reduce turbidity. The discharge nozzle will be held in place by two I-beam piles. The cofferdam was increased from 50 feet to 70 feet in width to incorporate the relocated discharge. The dredge and fill quantities will not change as a result of these modifications.

Your request for a modification of an intake/outfall structure to be placed in a waters of the United States (Rappahannock River) has been reviewed and found to satisfy the criteria contained in the Corps Nationwide Permit Number (7).

In addition to the above, you are requesting authorization under Nationwide Permit number 6 to conduct geotechnical borings within the intake/outfall structure area. Based on your drawings and plans, four borings are proposed, each to be 8-inches in diameter and 50 feet in depth. Each boring will produce approximately 2.5 cubic yards of dredge material for a total of 10 cubic yards. The boring activity will be conducted from a barge with dredge material to be deposited in an upland disposal site. Your work will be conducted outside of the of year restriction of March 1 to June 30.

Your request for verification of authorization to conduct geotechnical borings in a waters of the United States (Rappahannock River) has been reviewed and found to satisfy the criteria contained in the Corps Nationwide Permit Number (6) quoted below:

6. *Survey Activities.* Survey activities including core sampling, seismic exploratory operations, and plugging of seismic shot holes and other exploratory-type bore holes. Drilling and the discharge of excavated material from test wells for oil and gas exploration is not authorized by this nationwide permit. The discharge of drilling muds and cuttings may require a permit under section 402 of the Clean Water Act. (sections 10 and 404).

In addition to the above, you are requesting verification of authorization under Nationwide permit number 12 for a utility line crossing a waters of the United States (unnamed tributary to Birchwood Run). This letter verifies that your pipeline crossing of a waters of the United States (Birchwood Run) has been reviewed and found to satisfy the criteria contained in the Corps Nationwide Permit Number (12) quoted below:

12. *Utility Line Backfill and Bedding.*
Discharges of material for backfill or bedding for utility lines, including outfall and intake structures, provided there is no change in preconstruction contours. A "utility line" is defined as any pipe or pipeline for the transportation of any gaseous, liquid, liquefiable, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone and telegraph messages, and radio and television communication. The term "utility line" does not include activities which drain a water of the United States, such as drainage tile, however, it does apply to pipes conveying drainage from another area. Material resulting from trench excavation may be temporarily sidecast (up to three months) into waters of the United States provided that the material is not placed in such a manner that it is dispersed by currents or other forces. The District Engineer may extend the period of temporary side-casting up to 180 days, where appropriate. The area of waters of the United States that is disturbed must be limited to the minimum necessary to construct the utility line. In wetlands, the top 6" to 8" of the trench should generally be backfilled with topsoil from the trench. Excess material must be removed to upland areas immediately upon completion of construction. Any exposed slopes and streambanks must be stabilized immediately upon completion of he utility line. The utility line itself will require a Section 10 permit if in navigable waters of the United States. (See 33 CFR part 322). (section 404).

(The Corps Nationwide Permits and Regulations can be found in 33 CFR 330 published in Volume 56, Number 226 of the Federal Register dated November 22, 1991.) Provided the enclosed conditions are met, an individual Department of the Army Permit will not be required.

However, this verification is not valid until you obtain all required State and local permits. You may contact the Virginia Marine Resources Commission at (804) 247-2200 for information concerning State and local permit requirements.

Please include a copy of this letter if you submit an application to any State or local agency.

This verification is valid for two years from the date of this letter, unless the Norfolk District Engineer uses discretionary authority to modify, suspend or revoke this verification. The Chief of Engineers will periodically review the nationwide permits and their conditions and will decide to either modify, reissue or revoke the permits. If the nationwide permit(s) verified in this letter are reissued without modification or if your activity complies with any subsequent nationwide permit, the expiration date of this verification will not change. However, if the nationwide permit(s) verified in the letter are modified or revoked so that the activity listed above would no longer be authorized and you have commenced or are under contract to commence the work, you will have twelve months from the date of that permit change to complete the activity. Activities completed under the authorization of a nationwide permit which was in effect at the time the activity was completed continue to be authorized by that nationwide permit. If after consultation with Corps at the end of the 2-year period, there is no change in the NWP, the activity remains authorized until the NWPs expire in January, 1997.

It is your responsibility to remain informed of changes to the nationwide permits. We will issue a special public notice announcing any changes to the nationwide permits when they occur.

Lastly, you are requesting a written verification of your wetland delineation performed in June of 1991. Your wetland delineation was performed utilizing the 1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands. A site visit was performed on July 27, 1991 and a verbal jurisdictional determination was confirmed at that time.

The Norfolk District has determined that there would be no substantial difference in Corps jurisdiction on the SEI site utilizing either the 1989 Federal Manual of the 1987 Corps Manual. Based on the information provided to us, it has been determined by the Corps of Engineers that your jurisdictional wetland delineation is confirmed to be verified and accurate. This wetland jurisdictional delineation is valid for a period of three years from the date of this letter unless new information warrants revision of the delineation before the expiration date. A copy of your delineation report is on file in this office.

Should you have questions, please call Mr. Hal Wiggins at (703) 898-3568 at our Fredericksburg Field Office.

Sincerely,

Bruce F. Williams
Chief, Northern Virginia
Regulatory Section

Copies furnished:

Birchwood Power Partners, LP, Atlanta
Virginia State Water Control Board, Richmond
County of King George Department of Planning, King George

CF: Records, File

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated industrial wastewater and stormwater into a water body in King George County, Virginia.

PUBLIC COMMENT PERIOD: August 11, 2016 through September 12, 2016

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Industrial Wastewater and Stormwater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Birchwood Power Partners LP, 10900 Birchwood Drive, King George, VA 22485, VA0087645

NAME AND ADDRESS OF FACILITY: Birchwood Power Facility, 10900 Birchwood Drive, King George, VA 22485

PROJECT DESCRIPTION: Birchwood Power Partners has applied for a reissuance of a permit for the private Birchwood Power Facility. The applicant currently does not discharge, but if a discharge would occur the applicant proposes to release treated industrial wastewater and stormwater at an annualized average rate of 0.049 million gallons per day or less into a water body. The facility would release the treated industrial wastewater and stormwater in the Rappahannock River in King George County in the Rappahannock River watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, Total Suspended Solids, Oil and Grease, Total Residual Chlorine, Total Recoverable Chromium, Total Recoverable Zinc, Heat Rejection, Total Phosphorus, and 126 Priority Pollutants (Appendix A of 40 CFR 423). The permit establishes monitoring for the following pollutants: Total Nitrogen, Total Kjeldahl Nitrogen, Nitrate+Nitrite, and Acute Toxicity. The permit also includes requirements for cooling water intake structures.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by hand-delivery, e-mail, or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the draft permit and application at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.
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